ECS EX Series Hardware Guide

April 2023
Rev. 1.5

Contents

Figures..........4

Tables..........8

Revision history..........11

Chapter 1: EX-Series Hardware Overview..........**12**
- Introduction..........12
- Rack and node host names..........13

Chapter 2: Switches..........**15**
- Dell Technologies S5148F switch..........15
  - Front-end switch pair..........15
  - Back-end switch pair..........16
  - Front-end and back-end switch connections..........17
- Dell Technologies S5248F switch..........19
  - Front-end switch pair..........19
  - Back-end switch pair..........22
  - Front-end and back-end switch connections..........23
- Aggregation switch pair S5232F..........24
- Network connections between multiple ECS appliances in a single site..........25
- Connecting HDD Clusters to EXF900 Clusters..........29

Chapter 3: EX5000 Platform..........**30**
- EX5000 hardware components..........30
- EX5000 configurations..........31
- EX5000 upgrade paths..........36
- EX5000 server..........36
- EX5000 disk drives..........37
- EX5000 power cabling..........38
- EX5000 iDRAC cabling..........49
- EX5000 network cabling..........53
- EX5000 Cable Kits..........62

Chapter 4: EXF900 Platform..........**64**
- EXF900 hardware components..........64
- EXF900 configurations..........65
- EXF900 server..........68
  - Server front view..........69
  - Server rear view..........70
- EXF900 Upgrade Paths..........71
- EXF900 disk drives..........72
- EXF900 power cabling..........72
- EXF900 iDRAC cabling..........92
- EXF900 network cabling..........94
- EXF900 Cable Kits..........98

Aggregated EXF900 back-end network between multiple racks 99

Chapter 5: EX500 Platform........ 103
EX500 Hardware Components........ 103
EX500 configurations 105
EX500 upgrade paths........ 110
EX500 server........ 110
Server front view........ 111
Server back view........ 114
EX500 disk drives........ 115
EX500 power cabling........ 115
EX500 iDRAC cabling........ 123
EX500 network cabling........ 124

Chapter 6: EX300 Platform........ 132
EX300 hardware components........ 132
EX300 configurations 133
EX300 Upgrade Paths........ 135
EX300 server........ 135
Server front view........ 136
Server rear view........ 138
EX300 disk drives........ 139
EX300 power cabling........ 139
EX300 iDRAC cabling........ 148
EX300 network cabling........ 150

Chapter 7: EX3000 Platform........ 155
EX3000 hardware components........ 155
EX3000 configurations........ 156
EX3000 upgrade paths........ 160
EX3000 server........ 160
Server front view........ 161
Server rear view........ 165
EX3000 disk drives........ 168
EX3000 power cabling........ 169
EX3000 iDRAC cabling........ 179
EX3000 network cabling........ 183

Chapter 8: Third-Party Rack Requirements........ 191
Third-party rack requirements........ 191

Appendix A: 192
Document feedback........ 192

Index........ 193

Figures

1 Dell Technologies S5148F switch ports....15
2 Front-end switches....16
3 Back-end switches....17
4 Connections between front-end and back-end switches within an EX-Series rack....18
5 Back-end switch connections between EX-Series racks....18
6 Front-end switch connections to customer switches (example)....19
7 Dell Technologies S5248F switch ports....19
8 Front-end switches....20
9 Front-end switch connections to customer switches (4X10 example)....21
10 Front-end switch connections to customer switches (4X25 example)....21
11 Front-end switch connections to customer switches (4X100 example)....22
12 Back-end switches....22
13 Connections between front-end and back-end switches within an EX-Series rack....24
14 Linear or Daisy Chain topology....26
15 Split-brain topology....26
16 Inter-rack switch connectivity - linear topology (daisy-chain) between EX Series racks....26
17 Inter-rack switch connectivity - linear topology (daisy-chain) between an EX-Series rack and a Gen2 U-Series, D-Series, or C-Series rack....27
18 Ring topology....27
19 Inter-rack switch connectivity - ring topology....28
20 Star topology....28
21 Inter-rack switch connectivity - star topology....29
22 HDD to EXF900 private.4 network topology....29
23 EX5000 maximum configurations for dual and single node chassis....33
24 EX5000 minimum configurations for dual and single node chassis....34
25 EX5000 disk drive in carrier....37
26 Power PDU Mapping....38
27 EX5000 single-phase AC power cabling....39
28 EX5000 single-phase AC power cabling Line 1 cord Maximum Configuration....40
29 EX5000 single-phase AC power cabling Line 2 cord Maximum Configuration....41
30 EX5000 single-phase AC power cabling Line 3 cord Maximum Configuration....42
31 EX5000 three-phase delta AC power cabling....44
32 EX5000 three-phase delta AC power cabling Line 1 cord Maximum Configuration....45
33 EX5000 three-phase WYE AC power cabling....46
34 EX5000 three-phase WYE AC power cabling Line 1 cord Maximum Configuration....47
35 EX5000 three-phase WYE AC power cabling Line 1 cord Maximum Configuration....48
36 EX5000S single node iDRAC cabling....50
37 EX5000D dual node iDRAC cabling....52
38 Node ports on front-end switches....53
39 Back-end switch, front-end switch, and iDRAC ports on an EX5000S node....54

40 Back-end switch, front-end switch, and iDRAC ports on an EX5000D node........ 55
41 Node ports on back-end switches........ 56
42 EX5000 node network port cabling connections........ 56
43 EX5000 node network cable labeling........ 57
44 ECS EX5000S Dell Provided Switch/Network cabling........ 58
45 ECS EX5000S Customer Provided Switch/Network cabling........ 59
46 ECS EX5000D Dell Provided Switch/Network cabling........ 60
47 ECS EX5000D Customer Provided Switch/Network cabling........ 61
48 EXF900 minimum (left) and maximum (right) configurations........ 65
49 EXF900 server physical dimensions........ 68
50 EXF900 server chassis front view with 12 disks........ 69
51 EXF900 server chassis front view with 24 disks........ 69
52 Left control panel........ 69
53 Status LEDs decoded view........ 70
54 Right control panel........ 70
55 EXF900 server chassis rear view........ 71
56 EXF900 disk drive in carrier........ 72
57 EXF900 Standard Single-Phase AC 0U Cabling........ 75
58 EXF900 Single-Phase 0U Cabling with Aggregation Switch........ 77
59 EXF900 Standard Delta 0U Cabling........ 79
60 EXF900 Standard Three-Phase WYE 0U Cabling........ 80
61 EXF900 Three-Phase Delta 0U PDU with Aggregation Switch AC Cabling........ 82
62 EXF900 Three-Phase WYE 0U PDU with Aggregation Switch AC Cabling........ 83
63 EXF900 Standard Single-Phase 2U PDU AC Cabling........ 85
64 EXF900 Single-Phase 2U PDU Cabling with Aggregation Switch........ 87
65 EXF900 Standard Three-Phase 2U PDU AC Cabling........ 89
66 EXF900 Three-Phase 2U PDU with Aggregation Switch AC Cabling........ 91
67 Fox switch iDRAC ports........ 92
68 EXF900 iDRAC cabling........ 93
69 Front-end and back-end switch connections to an EXF900 node........ 94
70 Node ports on front-end switches........ 95
71 Back-end switch, front-end switch, and iDRAC ports on an EXF900 node........ 95
72 Node ports on back-end switches........ 95
73 EXF900 node network port cabling connections........ 96
74 EXF900 node network cable labeling........ 96
75 ECS v3 EXF900 network cabling........ 97
76 Aggregation topology........ 100
77 Inter-rack switch connectivity - aggregation topology........ 100
78 EX500 minimum and maximum configurations........ 105
79 EX500 server physical dimensions........ 111
80 EX500 server chassis front view........ 112
81 Left control panel........ 113
82 Status LEDs decoded view........ 113

83 Right control panel........ 114
84 EX500 server chassis back view........ 114
85 EX500 disk drive in carrier........ 115
86 EX500 Single Phase AC Cabling Diagram........ 119
87 EX500 Three Phase Delta AC Cabling Diagram........ 121
88 EX500 Three Phase WYE AC Cabling Diagram........ 122
89 Fox switch iDRAC ports........ 123
90 iDRAC cabling........ 124
91 Frontend and backend switch connections to an EX500 node........ 126
92 Node ports on frontend S5148F switches........ 127
93 Node ports on frontend S5248F switches........ 127
94 Network cable and labeling........ 127
95 Node ports on backend S5148F switches........ 128
96 Node ports on backend S5248F switches........ 128
97 EX500 node network port cabling connections........ 128
98 EX500 node network cable labeling........ 130
99 EX500 network cabling........ 131
100 EX300 minimum and maximum configurations........ 133
101 EX300 server physical dimensions........ 136
102 EX300 server chassis front view........ 136
103 Left control panel........ 137
104 Status LEDs decoded view........ 137
105 Right control panel........ 137
106 EX300 server chassis rear view........ 138
107 EX300 disk drive in carrier........ 139
108 EX300 single-phase AC power cabling........ 142
109 ECSv3 740xd Single Phase AC Cabling Diagram........ 143
110 Three-phase Delta AC power cabling........ 144
111 ECSv3 740xd Three Phase Delta AC Cabling Diagram........ 145
112 Three-phase WYE AC power cabling........ 146
113 ECSv3 740xd Three Phase WYE AC Cabling Diagram........ 147
114 Fox switch iDRAC ports........ 148
115 iDRAC cabling........ 149
116 Front-end and back-end switch connections to an EX300 node........ 150
117 Node ports on front-end S5148F switches........ 151
118 Node ports on front-end S5248F switches........ 151
119 Back-end switch, front-end switch, and iDRAC ports on an EX300 node........ 151
120 Node ports on back-end S5148F switches........ 151
121 Node ports on back-end S5248F switches........ 152
122 EX300 node network port cabling connections........ 152
123 EX300 node network cable labeling........ 153
124 EX300 network cabling........ 154
125 EX3000S minimum and maximum configurations for single node chassis........ 157

126 EX3000D minimum and maximum configurations for dual node chassis 158
127 EX3000 server front view in rack 161
128 EX3000 external chassis view 162
129 EX3000 internal chassis view 162
130 External view of server sled A in a EX3000D dual node chassis with two sleds 163
131 Front-panel features and indicators 163
132 EX3000D server rear view in rack 166
133 Back-panel features and indicators 167
134 EX3000 disk drive in carrier 168
135 PDU outlet numbers 169
136 PDU single-phase diagram 171
137 EX3000S single-phase AC power cabling 172
138 EX3000D single-phase AC power cabling 173
139 PDU three-phase diagram 174
140 EX3000S three-phase delta AC power cabling 175
141 EX3000D three-phase delta AC power cabling 176
142 EX3000S three-phase WYE AC power cabling 177
143 EX3000D three-phase WYE AC power cabling 178
144 EX3000S iDRAC cabling 180
145 EX3000D iDRAC cabling 182
146 Front-end and back-end switch connections to an EX3000S node 183
147 Front-end and back-end switch connections to an EX3000D node 184
148 Node ports on front-end S5148F switches 184
149 Node ports on front-end S5248F switches 185
150 Back-end switch, front-end switch, and iDRAC ports on an EX3000S node 185
151 Node ports on back-end S5148F switches 185
152 Node ports on back-end S5248F switches 186
153 EX3000 node network port cabling connections 186
154 EX3000 node network cable labeling 187
155 EX3000S network cabling 188
156 EX3000D network cabling 189

Tables

1 Revision history....11
2 Rack ID....13
3 Default node names....13
4 Switch port numbers....16
5 Switch port number....17
6 Switch port numbers....20
7 Switch port number....22
8 Switch port number....25
9 EX5000 hardware components....30
10 EX5000S single node chassis configurations....35
11 EX5000D dual node chassis configurations....35
12 EX5000 Features....36
13 EX5000 physical dimensions....37
14 EX5000S node iDRAC port to BE1 port mapping....49
15 EX5000D dual node iDRAC port to BE1 port mapping....51
16 Back-end cable kits....62
17 Front-end cable kits....62
18 Speed and model details....62
19 EXF900 hardware components....64
20 EXF900 configurations....66
21 Standard features of EXF900 servers....68
22 Decoding of LEDs in light bar....69
23 Server Panel, Ports, and Slots....71
24 EXF900 Standard Single-Phase 0U PDU Cabling....73
25 EXF900 0U PDU Cabling with Aggregation Switch....76
26 EXF900 Standard 0U Three-Phase PDU Cabling....78
27 EXF900 Three-Phase 0U Cabling with Aggregation Switch....81
28 EXF900 Standard Single-Phase 2U PDU Cabling....84
29 EXF900 Single-Phase 2U PDU Cabling with Aggregation Switch....86
30 EXF900 Standard Three-Phase 2U PDU Cabling....88
31 EXF900 Three-Phase 2U PDU with Aggregation Switch Cabling....90
32 EXF900 node iDRAC port to BE1 port mapping....92
33 Back-end cable kits....98
34 Front-end cable kits....98
35 Aggregation connection cable kits....98
36 Speed and model details....98
37 Aggregation port cabling....100
38 EX500 hardware components....103
39 EX500 configurations....107
40 EX500 Disk Upgrade Kit....110

41 Standard features of EX500 servers.......... 110
42 Decoding of LEDs in light bar.......... 113
43 EX500 0U PDU single-phase zone A/B mapping.......... 115
44 EX500 PDU three-phase Delta and WYE zone A/B mapping.......... 116
45 EX500 2U PDU single-phase zone A/B mapping.......... 117
46 EX500 2U PDU three-phase Delta and WYE zone A/B mapping.......... 118
47 EX500 node iDRAC port to BE1 port mapping.......... 123
48 EX300 hardware components.......... 132
49 EX300 configurations.......... 133
50 Standard features of EX300 servers.......... 135
51 Decoding of LEDs in light bar.......... 137
52 Server Panel, Ports, and Slots.......... 138
53 EX300 0U PDU cabling.......... 139
54 EX300 2U PDU cabling.......... 140
55 EX300 node iDRAC port to BE1 port mapping.......... 148
56 EX3000 hardware components.......... 155
57 EX3000S single node chassis configurations.......... 158
58 EX3000D dual node chassis configurations.......... 159
59 EX3000 physical dimensions.......... 160
60 Server indicators, buttons, or connectors.......... 163
61 Server indicators, buttons, or connectors.......... 167
62 EX3000S PDU cabling.......... 169
63 EX3000D PDU cabling.......... 169
64 EX3000S node iDRAC port to BE1 port mapping.......... 179
65 EX3000D node iDRAC port to BE1 port mapping.......... 181
66 Legend for Back-end switch, front-end switch, and iDRAC ports on EX3000S node.......... 185

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

© 2022 Dell Inc. or its subsidiaries. All rights reserved. Dell Technologies, Dell, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.

Revision history

Table 1. Revision history

Revision Date	Description of change
September 2019	Rev1.0. Initial release of document for EX500 release.
June 2021	Rev 1.1 Updates for 16 TB support on ECS version 3.5 and 2 TB and 4 TB support on ECS version 3.7.
July 2022	Rev 1.2 Updates for S5248F-ON Switch qualification.
September 2022	Rev 1.3 Updates for 20TB/192GB memory support.
January 2023	Rev 1.4 Updates to change QSFP28 in EX500 servers.
April 2023	Rev 1.5 Updates to add 20 TB support for EX 5000

1

EX-Series Hardware Overview

Topics:

- Introduction
- Rack and node host names

Introduction

This guide describes the hardware components that make up the ECS appliance Generation 3 (Gen3) hardware models.

ECS Gen3 appliance series

The ECS Gen3 appliance series include:

- EX5000 is an ultra dense 5U enclosure that supports up to 100 x 3.5-inch drives, with Dual and Single node setup. This solution is targeted at the object, file, and video surveillance workloads.
    - The dual node EX5000D platform starts at 3.2 PB RAW minimum configuration and scales up to 14.0 PB RAW per rack
    - The single node EX5000S platform starts at 2.0 PB RAW minimum configuration and scales up to 14.0 PB RAW per rack.
- EXF900 is an all flash object storage solution of hyper-converged nodes for low latency and high Input or Output Operations Per Second (IOPs) ECS deployments. This platform starts at 230 TB RAW minimum configuration and scales up to 5.76 PB RAW per rack.

  NOTE: ECS 3.7 supports EX900 15.36 TB offering.
- EX500 series: A dense object storage solution of hyper-converged nodes for small to medium-sized ECS deployments. The EX500 supports node expansion in increments of one when the capacity is the same as the previous node. If the capacity is different from the previous node when expanding, EX500 supports expansion in a minimum of five-node increments. The recommended expansion is five nodes. The EX500 series supports from 5 to 16 nodes per rack. With different drive sizes/quantity and the flexibility of node additions, this platform can scale from 120 TB RAW to 7.68 PB RAW per rack.

  NOTE: ECS 3.7 supports 2 TB, 4 TB, and 20 TB on EX500 offerings.
- EX300 series: A dense object storage solution of hyper-converged nodes for small to medium-sized ECS deployments. With different drive sizes and the flexibility of single node addition, this platform can scale from 60 TB RAW to 3.08 PB RAW per rack.
- EX3000 series: This is an ultradense object storage solution of hyper-converged nodes for medium to large-sized ECS deployments. This platform starts at a 2.16 PB RAW minimum configuration and scales to 11.52 PB RAW per rack.

Note: In this document, the term *node* is used interchangeably with *server*, and the term *appliance* references a cluster of nodes running ECS software.

Hardware generations

ECS appliances are characterized by hardware generation.

Gen3

- EX5000 Gen3 models featuring 16 TB or 20 TB disks (5U ultra dense storage chassis with single or dual node configurations). Lower 1U contains 1x or 2x server sleds and 2x expander modules and the top 4U for 100x 3.5" SATA HDDs, with up to 50 disks per compute sled. ECS 3.7 and later support this hardware configuration.
- EXF900 Gen 3 models featuring 3.84 TB NVMe SSD became available in November of 2020. ECS 3.6 and later support this hardware configuration and ECS 3.6.1 and later supports 7.68 TB and 15.36 TB NVMe SSDs.
- EX500 Gen3 models featuring 2 TB, 4 TB, 8 TB, 12 TB, 16 TB, or 20 TB disks (12 or 24 x hard drive per node) became available in September 2019. ECS 3.5 and later supports 16 TB data drives and optional Read Cache SSD upgrade. ECS 3.7 supports 20 TB disks.

- EX300 Gen3 models featuring 1 TB, 2 TB, 4 TB, 8 TB, or 16 TB disks (12 hard drive per 2U node) became available in August 2018. ECS 3.5 and later supports 16 TB data drives and optional Read Cache SSD upgrade.
- EX3000 Gen3 models featuring 12 TB disks (4U chassis with single or dual node configurations) became available in August 2018. ECS 3.5 and later supports 16 TB data drives and optional Read Cache SSD upgrade.

Gen2

For documentation on Gen2 hardware, see the *Dell EMC ECS D- and U-Series Hardware Guide*.

- U-Series Gen 2 model featuring 8 TB disks became available in October 2015.
- U-Series Gen2 models featuring 12 TB disks became available in March 2018.
- The D-Series was introduced in October 2016 featuring 8 TB disks. D-Series models featuring 10 TB disks became available March 2017.
- The original U-Series appliance (Gen1) was replaced in October 2015 with second-generation hardware (Gen2).

Rack and node host names

Lists the default rack and node host names for an ECS Appliance.

The default rack IDs and color names are assigned in installation order as shown in the following table.

Table 2. Rack ID

Rack ID	Rack color	Rack ID	Rack color	Rack ID	Rack color
1	red	18	carmine	35	cornsilk
2	green	19	auburn	36	ochre
3	blue	20	bronze	37	lavender
4	yellow	21	apricot	38	ginger
5	magenta	22	jasmine	39	ivory
6	cyan	23	army	40	carnelian
7	azure	24	copper	41	taupe
8	violet	25	amaranth	42	navy
9	rose	26	mint	43	indigo
10	orange	27	cobalt	44	veronica
11	chartreuse	28	fern	45	citron
12	pink	29	sienna	46	sand
13	brown	30	mantis	47	russet
14	white	31	denim	48	brick
15	gray	32	aquamarine	49	avocado
16	beige	33	baby	50	bubblegum
17	silver	34	eggplant		

Nodes are assigned node names based on their order within the server chassis and within the rack itself. The following table lists the default node names.

Table 3. Default node names

Node	Node name	Node	Node name
1	provo	9	boston
2	sandy	10	chicago
3	orem	11	houston

Table 3. Default node names (continued)

Node	Node name	Node	Node name
4	ogden	12	phoenix
5	layton	13	dallas
6	logan	14	detroit
7	lehi	15	columbus
8	murray	16	austin

Nodes that are positioned in the same slot in different racks at a site have the same node name. For example, node 4 is called `ogden`, assuming that you use the default node names.

The `getrackinfo` command identifies nodes by a unique combination of node name and rack name. For example, node 4 in rack 1 is identified as `ogden-red` and can be pinged using its NAN resolvable (through mDNS) name: `ogden-red.nan.local`.

2

Switches

Topics:

- Dell Technologies S5148F switch
- Dell Technologies S5248F switch
- Aggregation switch pair S5232F
- Network connections between multiple ECS appliances in a single site
- Connecting HDD Clusters to EXF900 Clusters

Dell Technologies S5148F switch

The EX300, EX500, and EX3000 appliances support the Dell Technologies S5148F for the front-end pair of switches and for the pair of back-end switches. Customers have the option of using their own front-end switches instead of the Dell Technologies S5148F switches. The Dell Technologies S5148F switches are required for the back-end pair.

NOTE: Starting from ECS 3.7, the EX500, EX300 and EX3000 support S5248F or the S5148F for the front-end pair of switches and for the pair of back-end switches.

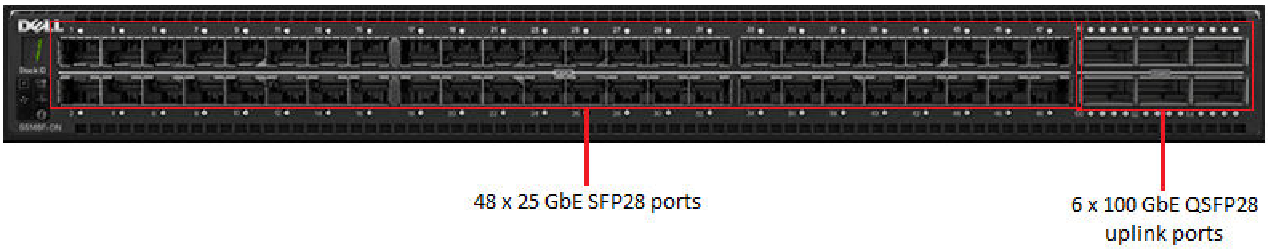


Figure 1. Dell Technologies S5148F switch ports

Front-end switch pair

Dell Technologies offers an optional HA pair of front-end 25 GbE S5148F switches for customer network connection to the rack. It has two 100 GbE virtual link trunking (VLT) cables per HA pair. These switches are called the Hare (FE2) and the Rabbit (FE1) switches.

Customers can use their own front-end switch pair (10/25 GbE for EX300 and 25 GbE for EX3000 and EX500). In this case, the customer must provide the appropriate VLT cables, SFPs, or external connection cables.

CAUTION: It is required to have connections from the customer's network to both front-end switches (rabbit and hare) in order to maintain the high availability architecture of the ECS appliance. If the customer chooses not to connect to their network in the required HA manner, there is no guarantee of high data availability for the use of this product.

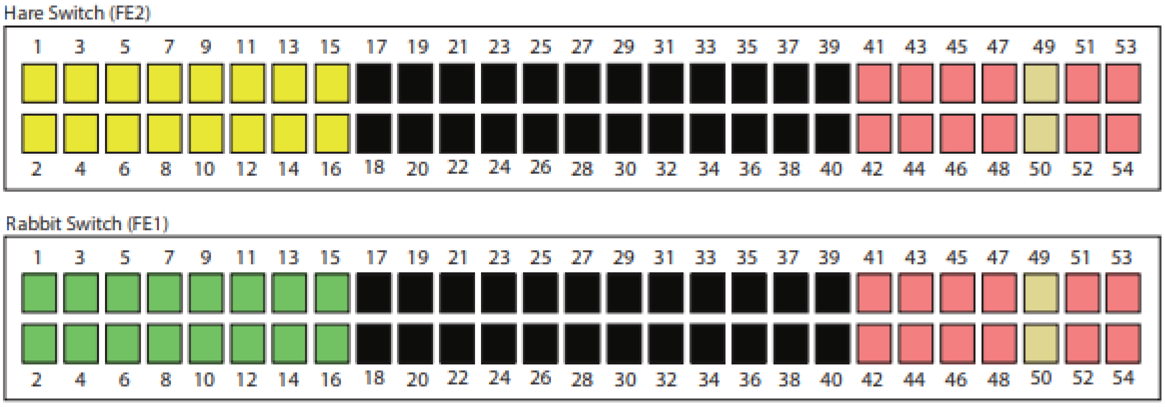

Hare Switch (FE2)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54
Rabbit Switch (FE1)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54

Figure 2. Front-end switches

Table 4. Switch port numbers

Switch	Port number	Description
Hare	1-16	Data network ports connected to nodes (10/25 GbE)
	17-40	Not designated
	41-48	Customer uplink ports (10/25 GbE)
	49-50	VLT ports (100 GbE)
	51-54	Customer uplink ports (100 GbE)
Rabbit	1-16	Data network ports connected to nodes (10/25 GbE)
	17-40	Not designated
	41-48	Customer uplink ports (10/25 GbE)
	49-50	VLT ports (100 GbE)
	51-54	Customer uplink ports (100 GbE)

Back-end switch pair

Dell Technologies provides two 25 GbE S5148F back-end switches (BE1 and BE2) with two 100 GbE VLT cables. These switches are named as the Hound (BE2) and Fox (BE1) switches.

In the following diagram, all labeled ports relate to an ECS virtual data center (VDC) where all racks and nodes are EX-Series (Gen3 hardware), except for ports 39 and 40. Ports 39 and 40 are only used in the scenario where there is Gen2 hardware series integration with EX-Series hardware in the VDC. When Gen2 hardware is mixed with EX-Series hardware, ports 39 and 40 are the only ports used for connectivity.

All iDRAC cables from nodes and all front-end switch management cable connections route to the Fox (BE1) switch.

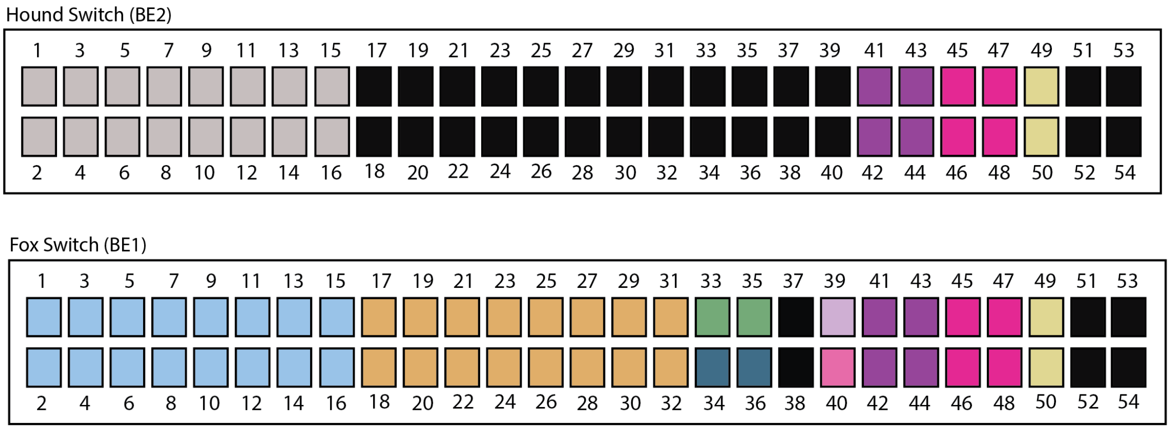

Hound Switch (BE2)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54
Fox Switch (BE1)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54

Figure 3. Back-end switches

Table 5. Switch port number

Switch	Port number	Description
Hound	1-16	Private network ports connected to nodes (10/25 GbE).
	17-40	These are not designated.
	41-44	In from EX-Series rack when the ECS system has more than one rack (10/25 GbE).
	45-48	Out to EX-Series rack when the ECS system has more than one rack (10/25 GbE).
	49-50	VLT ports (100 GbE).
	51-54	These are not designated (100 GbE).
Fox	1-16	Private network ports connected to nodes (10/25 GbE).
	17-32	iDRAC ports.
	33	To Rabbit (FE1) switch.
	34	To service tray in front.
	35	To Hare (FE2) switch.
	36	Open for rear service connectivity.
	37-38	These are not designated.
	39	In from Gen2 Turtle switch.
	40	Out to Gen2 Turtle switch.
	41-44	In from EX-Series rack when the ECS system has more than one rack (10/25 GbE).
	45-48	Out to EX-Series rack when the ECS system has more than one rack (10/25 GbE).
	49-50	VLT ports (100 GbE).
	51-54	These are not designated (100 GbE).

Front-end and back-end switch connections

The front-end switch management ports connect to back-end switch ports using two CAT6 cable and two 1GBaseT SFP.

The two cables and two SFP are used for Dell Technologies switches. If you are deploying in a third-party rack with customer switches, or using customer switches in a Dell Technologies rack, these are not required.

The connections between the front-end switch ports and back-end switch ports are as follows:

- Hare (FE2) to Fox (BE1)

- Rabbit (FE1) to Hound (BE2)

The connections are shown with green lines in the following diagram.

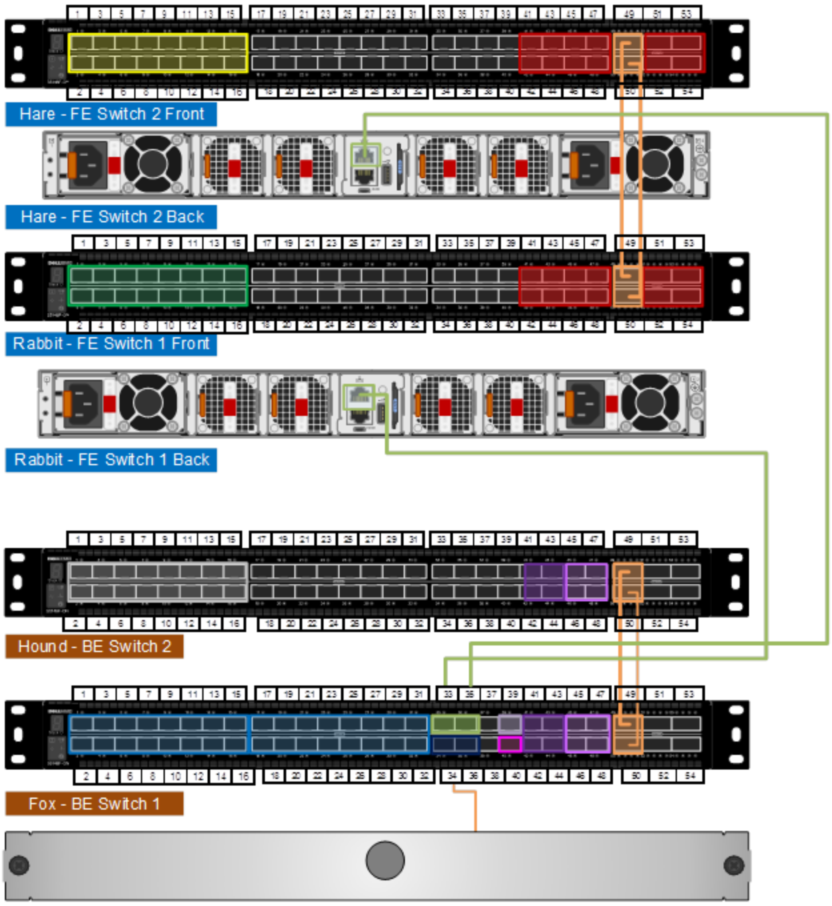

Hare - FE Switch 2 Front
Hare - FE Switch 2 Back
Rabbit - FE Switch 1 Front
Rabbit - FE Switch 1 Back
Hound - BE Switch 2
Fox - BE Switch 1

Figure 4. Connections between front-end and back-end switches within an EX-Series rack

For back-end switch connections between EX-Series racks, port 41 is used for the inbound connection and port 45 is used for the outbound connection. These ports are used for linear and ring topology rack-to-rack connectivity. For more information, seeNetwork connections between multiple ECS appliances in a single site .

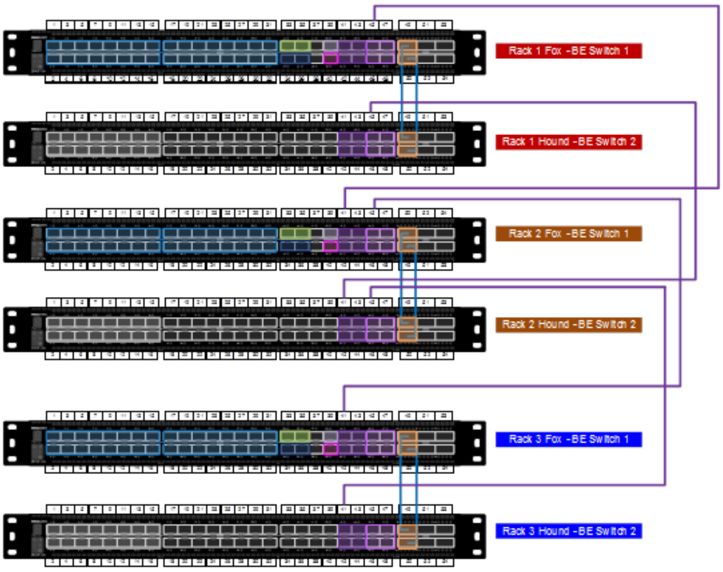

Rack 1 Fox -BE Switch 1
Rack 1 Hound -BE Switch 2
Rack 2 Fox -BE Switch 1
Rack 2 Hound -BE Switch 2
Rack 3 Fox -BE Switch 1
Rack 3 Hound -BE Switch 2

Figure 5. Back-end switch connections between EX-Series racks

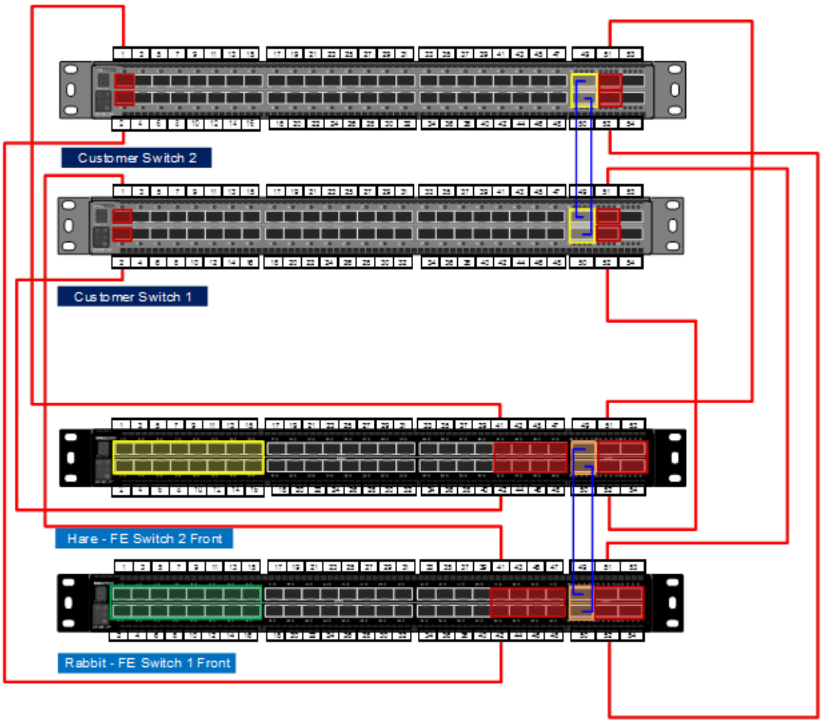

Customer Switch 2
Customer Switch 1
Hare - FE Switch 2 Front
Rabbit - FE Switch 1 Front

Figure 6. Front-end switch connections to customer switches (example)

Dell Technologies S5248F switch

The EX5000, EXF900, EX300, EX3000, and EX500 appliances use the Dell Technologies S5248F for the front-end pair of switches and for the pair of back-end switches. Customers have the option of using their own front-end switches instead of the Dell Technologies S5248F switches. The Dell Technologies S5248F switches are required for the back-end pair.

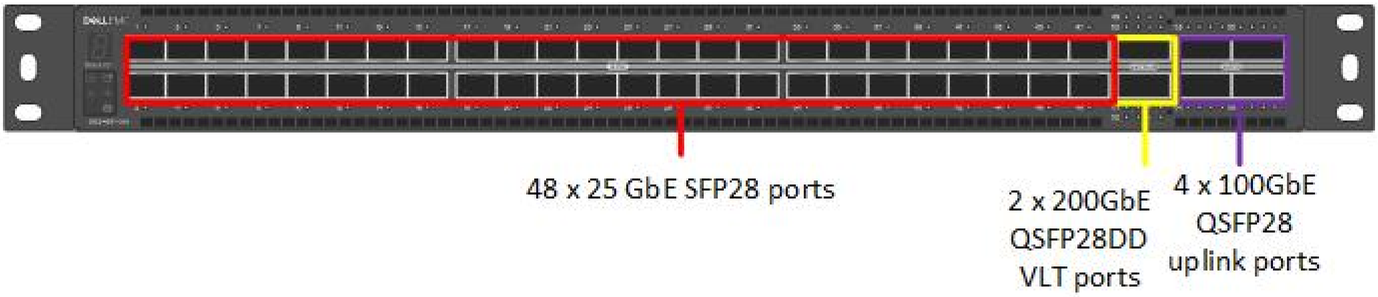

48 x 25 GbE SFP28 ports
2 x 200GbE QSFP28DD VLT ports
4 x 100GbE QSFP28 uplink ports

Figure 7. Dell Technologies S5248F switch ports

Front-end switch pair

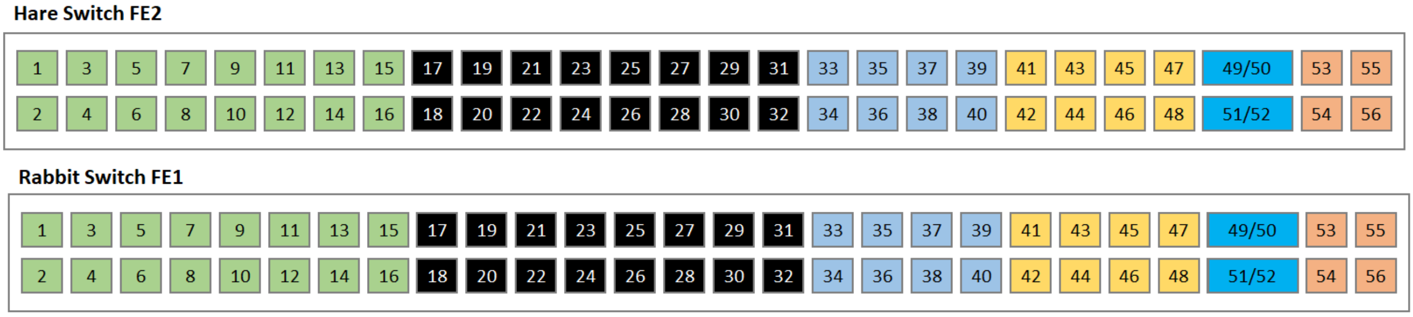
Dell Technologies offers an optional HA pair of front-end 25 GbE S5248F switches for customer network connection to the rack. It has two 200 GbE (QSFP28-DD) virtual link trunking (VLT) cables per HA pair. These switches are called the Hare (FE2) and the Rabbit (FE1) switches.

The S5248F does not auto negotiate based on optic type or cable type. ECS has created specific uplink ports for 10 GbE and 25 GbE customer networks. ECS has also created specific configuration files to configure ports 53-56 as 40 GbE or 100 GbE for customer uplink. See the table below for port breakout for each personality.

For use with the EX300, specific 10 Gb configuration files are required. The 10Gb configuration files are installed on racked configurations from the factory. For loose configuration, load the 10Gb files on site. The files are stored on loose switch. You can also download the files from SolVe.

Customers can use their own front-end switch pair (25 GbE for EXF900, EX500, EX300, EX3000, and EX5000). In this case, the customer must provide the appropriate switches, VLT cables, SFPs, or external connection cables.

CAUTION: It is required to have connections from the customer's network to both front-end switches (rabbit and hare) in order to maintain the high availability architecture of the ECS appliance. If the customer chooses not to connect to their network in the required HA manner, there is no guarantee of high data availability for the use of this product.



Hare Switch FE2

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Rabbit Switch FE1

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Figure 8. Front-end switches

Table 6. Switch port numbers

Switch	Port number	Description
Hare	1-16	Data network ports connected to nodes (25 GbE)
	17-32	Not designated
	33-40	Customer uplink ports (10 GbE)
	41-48	Customer uplink ports (25 GbE)
	49-52	VLT ports (2 x 200 GbE)
	53-56	Customer uplink ports (40GbE/100GbE based on switch configuration file loaded)
Rabbit	1-16	Data network ports connected to nodes (25 GbE)
	17-32	Not designated
	33-40	Customer uplink ports (10 GbE)
	41-48	Customer uplink ports (25 GbE)
	49-52	VLT ports (2 x 200 GbE)
	53-56	Customer uplink ports (40GbE/100GbE based on switch configuration file loaded)

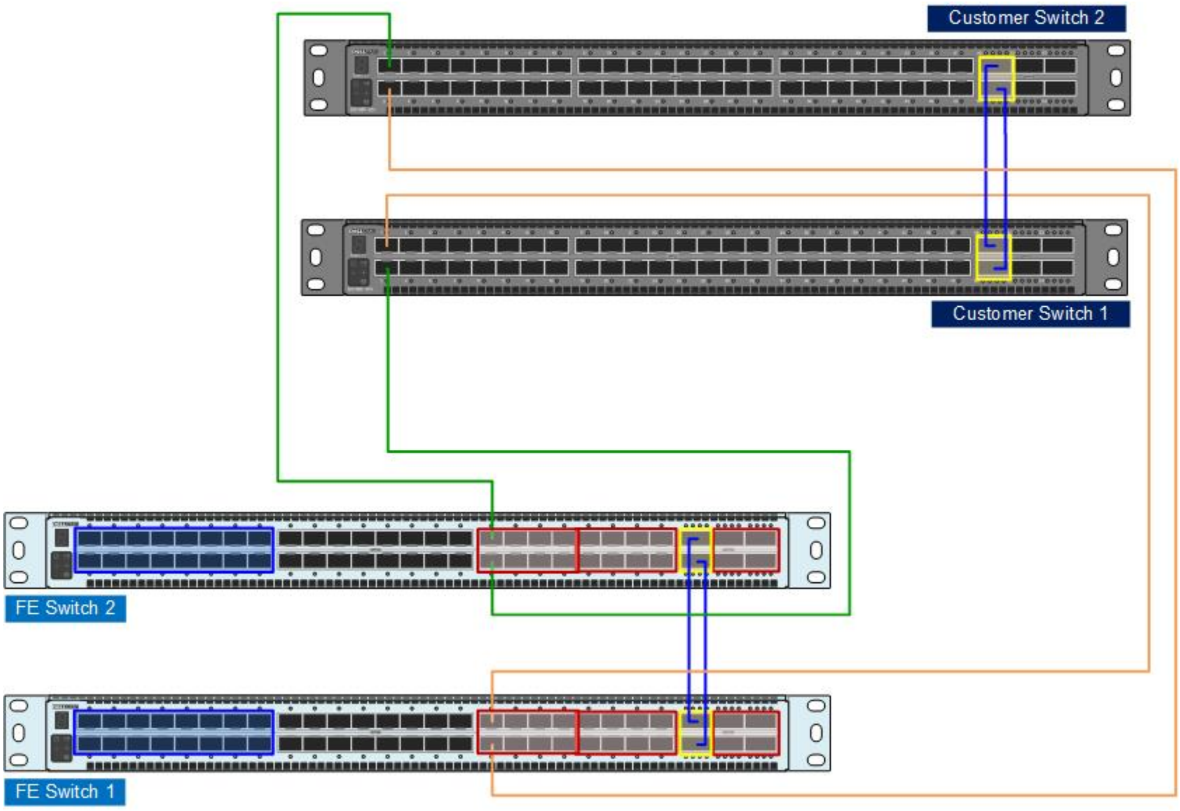

Customer Switch 2
Customer Switch 1
FE Switch 2
FE Switch 1

Figure 9. Front-end switch connections to customer switches (4X10 example)

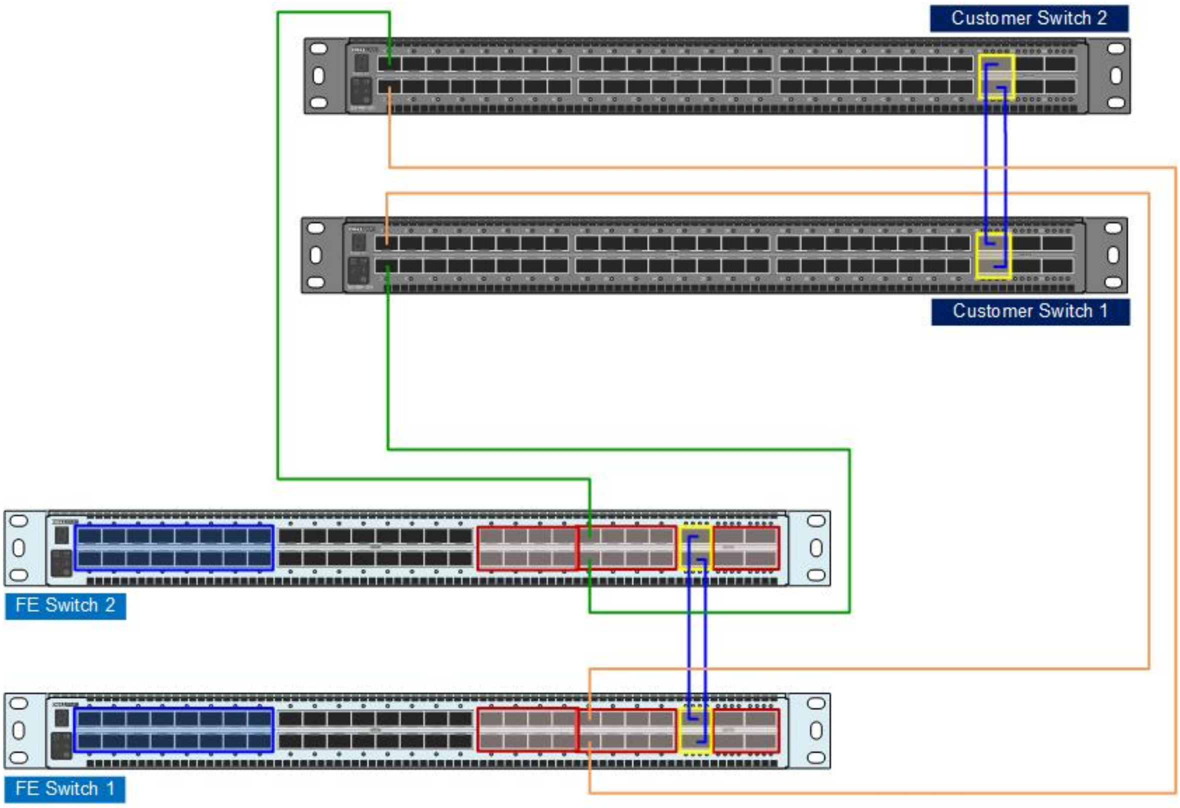

Customer Switch 2
Customer Switch 1
FE Switch 2
FE Switch 1

Figure 10. Front-end switch connections to customer switches (4X25 example)

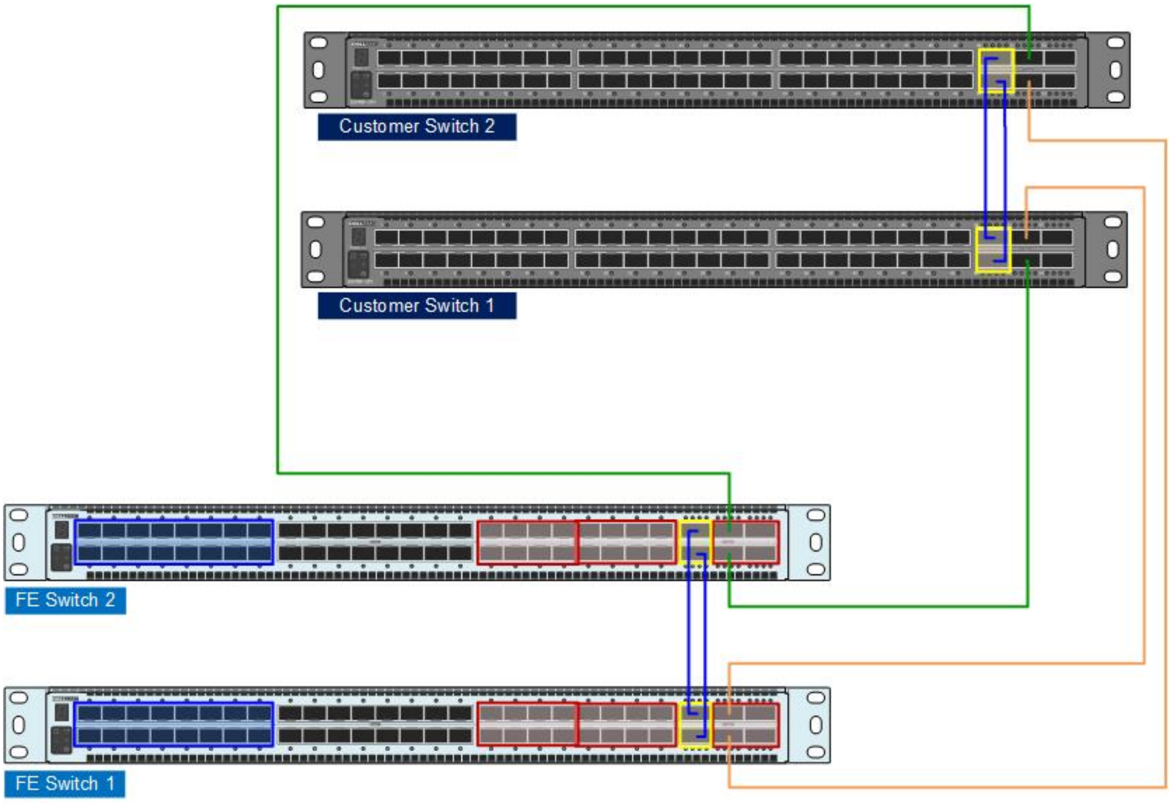


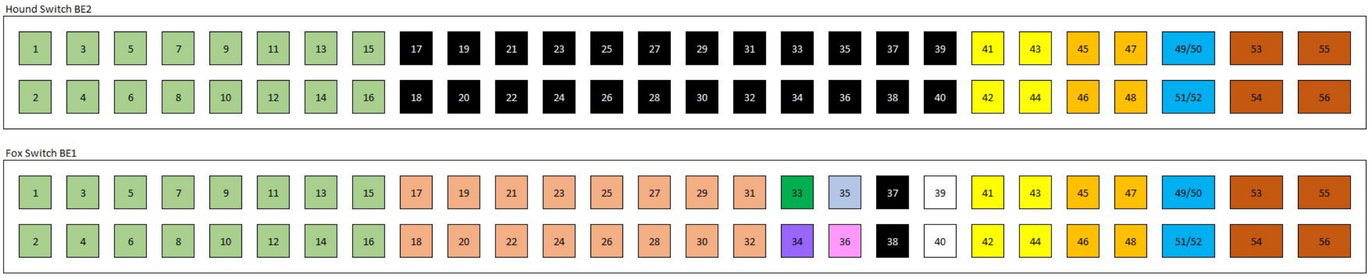
Figure 11. Front-end switch connections to customer switches (4X100 example)

Back-end switch pair

Dell Technologies provides two 25 GbE S5248F back-end switches (BE1 and BE2) with two X 200 GbE (QSFP28-DD) VLT cables. These switches are named as the Hound (BE2) and Fox (BE1) switches.

The following diagram of the labeled ports is for EXF900, EX500, EX300, EX3000, or EX5000.

All iDRAC cables from nodes and all front-end switch management cable connections route to the Fox (BE1) switch.



Hound Switch BE2

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Fox Switch BE1

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Figure 12. Back-end switches

Table 7. Switch port number

Switch	Port number	Description
Hound	1-16	Private network ports connected to nodes (25 GbE).
	17-40	These are not designated.
	41-44	In from EX-Series rack when the ECS system has more than one rack (25 GbE).
	45-48	Out to EX-Series rack when the ECS system has more than one rack (25 GbE).
	49-52	VLT ports (2 x 200 GbE).

Table 7. Switch port number (continued)

Switch	Port number	Description
	53-56	Uplink to Falcon aggregation switch (EXF900 only) (100 GbE).
Fox	1-16	Private network ports connected to nodes (25 GbE).
	17-32	iDRAC ports.
	33	To Rabbit (FE1) switch.
	34	To service tray in front.
	35	To Hare (FE2) switch.
	36	Open for rear service connectivity.
	37-38	These are not designated.
	39	In from Gen2 Turtle switch.
	40	Out to Gen2 Turtle switch.
	41-44	In from EX-Series rack when the ECS system has more than one rack (25 GbE).
	45-48	Out to EX-Series rack when the ECS system has more than one rack (25 GbE).
	49-52	VLT ports (2 x 200 GbE).
	53-56	Uplink to Eagle aggregation switch (EXF900 only) (100 GbE).

Front-end and back-end switch connections

The front-end switch management ports connect to back-end switch ports using two CAT6 cable and two 1GBaseT SFP.

The two cables and two SFP are used for Dell Technologies switches. If you are deploying in a third-party rack with customer switches, or using customer switches in a Dell Technologies rack, these are not required.

The connections between the front-end switch ports and back-end switch ports are as follows:

- Hare (FE2) to Fox (BE1)
- Rabbit (FE1) to Fox (BE1)

The connections are shown with green lines in the following diagram.

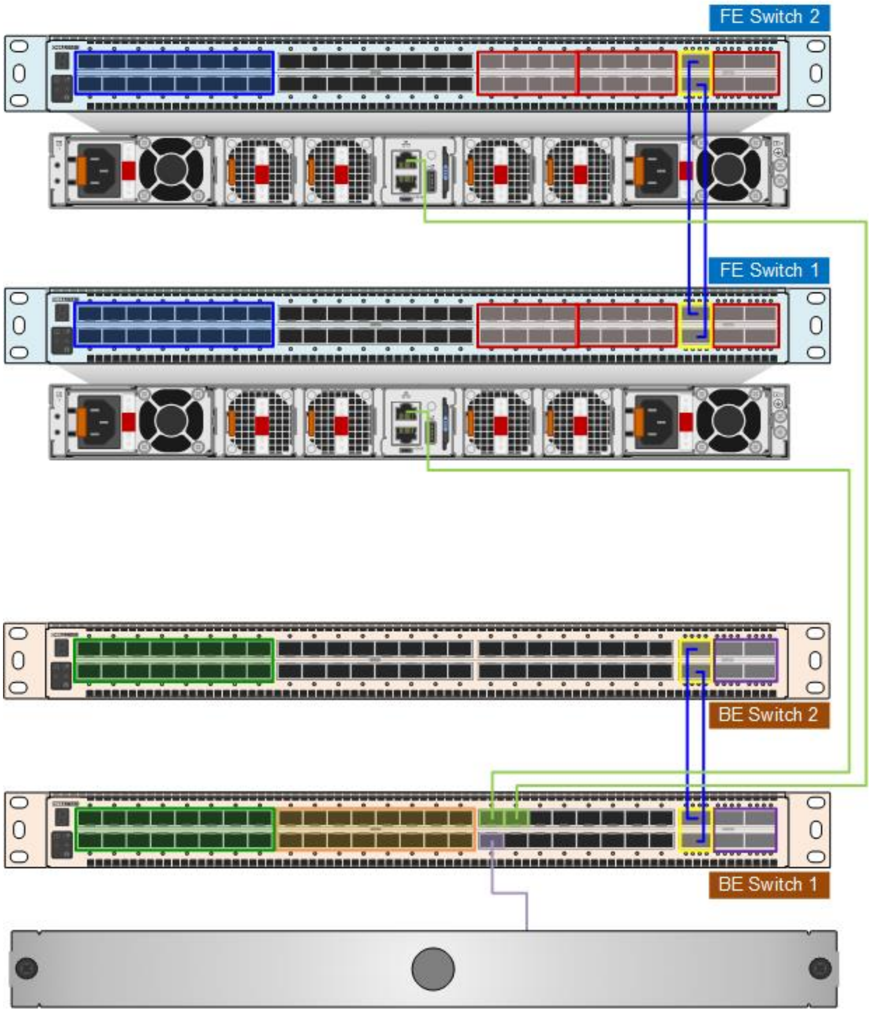

FE Switch 2
FE Switch 1
BE Switch 2
BE Switch 1

Figure 13. Connections between front-end and back-end switches within an EX-Series rack

NOTE: The rectangular box at the bottom is the service tray.

Aggregation switch pair S5232F

Dell Technologies provides two 100GbE S5232F back-end aggregation switches (AGG1 and AGG2) with four 100GbE VLT cables. These switches are named as the Falcon (AGG2) and Eagle (AGG1) switches and are required when expanding beyond one rack of EXF900 nodes.

In the following diagram, all labeled ports indicate the port designations. This configuration allows up to seven racks of EXF900 nodes to connect.

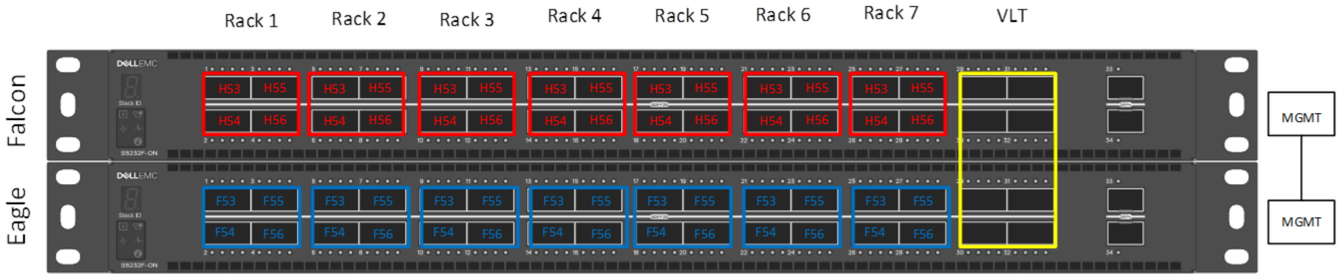

Rack 1
Rack 2
Rack 3
Rack 4
Rack 5
Rack 6
Rack 7
VLT
Falcon
Eagle
H53
H55
H54
H56
F53
F55
F54
F56
MGMT
MGMT

Table 8. Switch port number

Switch	Port number	Description
Falcon	1-4	Rack1 Hound uplink ports
	5-8	Rack2 Hound uplink ports
	9-12	Rack3 Hound uplink ports
	13-16	Rack4 Hound uplink ports
	17-20	Rack5 Hound uplink ports
	21-24	Rack6 Hound uplink ports
	25-28	Rack7 Hound uplink ports
	29-32	VLT
	33-34	Unused
Eagle	1-4	Rack1 Fox uplink ports
	5-8	Rack2 Fox uplink ports
	9-12	Rack3 Fox uplink ports
	13-16	Rack4 Fox uplink ports
	17-20	Rack5 Fox uplink ports
	21-24	Rack6 Fox uplink ports
	25-28	Rack7 Fox uplink ports
	29-32	VLT
	33-34	Unused

NOTE: It is recommended to connect the aggregation connections between the rack back-end and the aggregation switches in sequential order to maintain consistency across customer sites. For example, for Rack 2 Aggregation Cabling:

- Fox 53 -> Eagle 5
- Fox 54 -> Eagle 6
- Fox 55 -> Eagle 7
- Fox 56 -> Eagle 8
- Hound 53 -> Falcon 5
- Hound 54 -> Falcon 6
- Hound 55 -> Falcon 7
- Hound 56 -> Falcon 8

Network connections between multiple ECS appliances in a single site

The private.4 network interconnects multiple, co-located ECS intrarack networks into a single interrack network through VLAN 4. Ports 41 - 44 are used to create port channel 100 and ports 45 through 48 are used to create port channel 101 on the back-end switch. Port channels 100 and 101 are used to connect to other intrarack LANs.

NOTE: The private.4 network is also called as the Nile Area Network (NAN).

The ECS intrarack backend management networks are connected together to create the interrack topology. The interrack network is created by connecting either port channel 100 or 101 to another private switch from another ECS intrarack network. Through these connections, nodes from any intrarack network can communicate to any other node on the interrack network. There are three types of topologies that you can use to connect the intrarack LANs into an interrack network:

- Daisy chain or line topology

- Ring topology
- Star topology

Linear or daisy chain topology

The simplest topology to connect the intraracks together does not require any extra equipment. All the private switches can be connected together in a linear or Daisy chain fashion as demonstrated below.

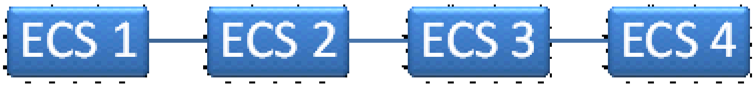

ECS 1
ECS 2
ECS 3
ECS 4

Figure 14. Linear or Daisy Chain topology

This linear or daisy-chain topology is the least dependable setup and is susceptible to split-brain topologies as demonstrated below.

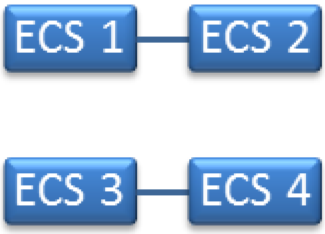

ECS 1
ECS 2
ECS 3
ECS 4

Figure 15. Split-brain topology

The interrack linear topology between EX-Series racks is shown in the following figure.

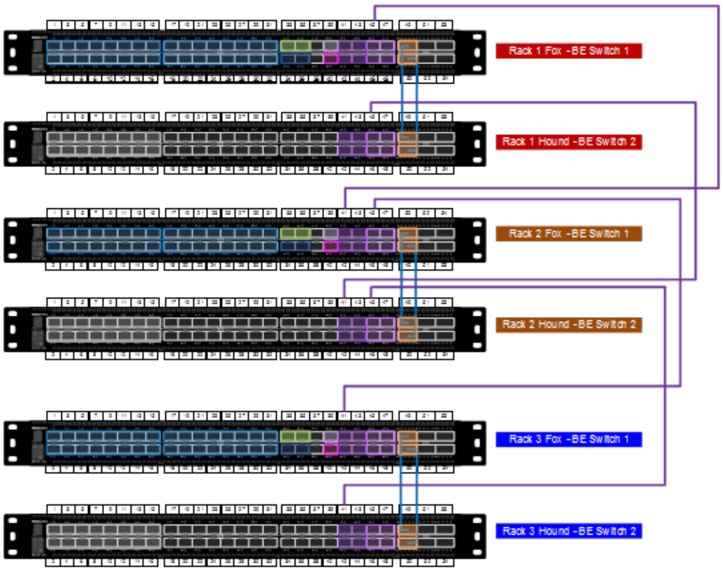

Rack 1 Fox -BE Switch 1
Rack 1 Hound -BE Switch 2
Rack 2 Fox -BE Switch 1
Rack 2 Hound -BE Switch 2
Rack 3 Fox -BE Switch 1
Rack 3 Hound -BE Switch 2

Figure 16. Inter-rack switch connectivity - linear topology (daisy-chain) between EX Series racks

The interrack linear topology between an EX-Series rack and a Gen2 rack is shown in the following figure. For a mixed Gen2 and Gen3 environment, use Turtle switch port 51 for inbound, and port 52 for outbound. On the Gen3 Fox switch, use port 39 for inbound and port 40 for outbound. This is a requirement for mixing Gen2 and Gen3 racks in the same VDC. Ports 39 and 40 are not used in an all Gen3 environment with EX-Series racks.

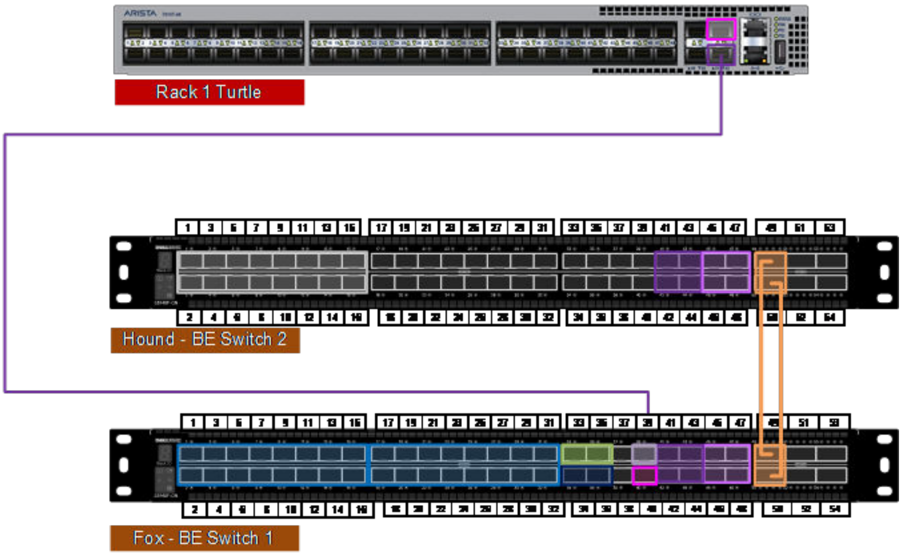


Figure 17. Inter-rack switch connectivity - linear topology (daisy-chain) between an EX-Series rack and a Gen2 U-Series, D-Series, or C-Series rack

Ring topology

For a more reliable network, the ends of the daisy chain topology can be connected together to create a ring network as demonstrated below. The ring topology would require two physical link breaks in the topology to create split-brain issue in the private.4 network.

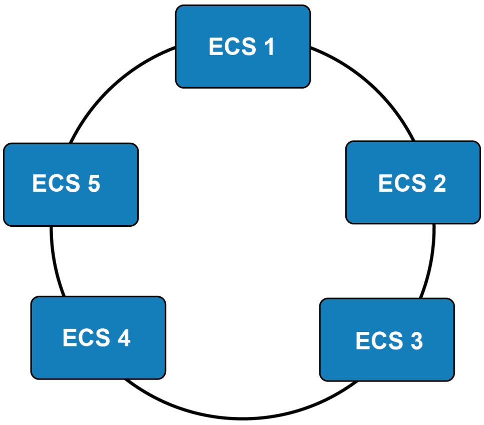


Figure 18. Ring topology

The ring topology is similar to the daisy chain topology, except that it is more robust since it requires two points of failure to break the topology which would cause a split-brain issue.

The interrack ring topology between EX-Series racks are shown in the following figure.

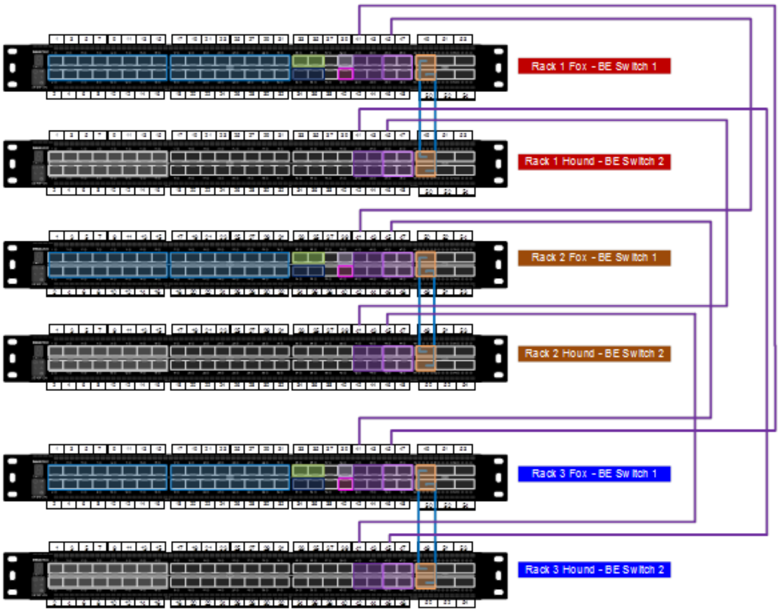

Rack 1 Fox - BE Switch 1
Rack 1 Hound - BE Switch 2
Rack 2 Fox - BE Switch 1
Rack 2 Hound - BE Switch 2
Rack 3 Fox - BE Switch 1
Rack 3 Hound - BE Switch 2

Figure 19. Inter-rack switch connectivity - ring topology

Star topology

The limitation with the daisy chain or ring topologies is that they do not scale well for large installations. For ten or more ECS racks, one or two aggregation switches should be added support the large installation. For high availability, the recommended topology is to use two aggregation switches with port channel (VLT, vPC, MLAG) connectivity between them. If you use a single aggregation switch, both the Fox switch (BE1) and the Hound switch (BE2) are connected to the single switch. The impact of using only one aggregation switch is the loss of high availability for the aggregation switch. For connectivity to aggregation switches, use the inbound port 41 on each back-end switch to link to one or more aggregation switches.

By using aggregation switches to connect to all the intrarack networks, the star topology provides better protection against the split-brain issue than both the daisy chain/linear or ring topologies. With aggregation switches, link failures are isolated to a single intrarack network in the private.4 network.

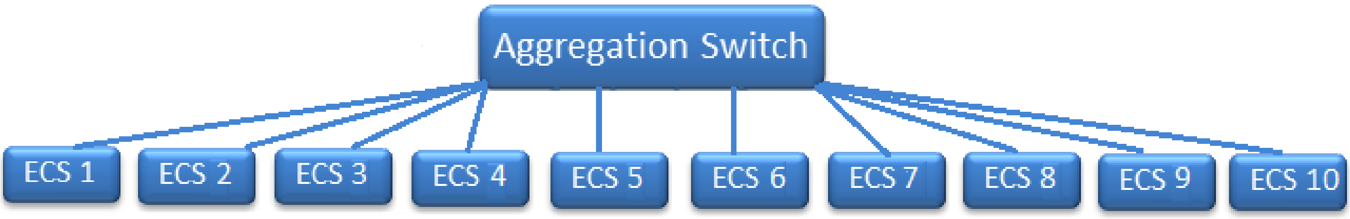

Aggregation Switch
ECS 1
ECS 2
ECS 3
ECS 4
ECS 5
ECS 6
ECS 7
ECS 8
ECS 9
ECS 10

Figure 20. Star topology

The aggregation switches connecting to the intrarack networks must be set up as a trunk and allow VLAN traffic to flow between all ports in the interrack network.

The interrack star topology between EX-Series racks are shown in the following figure.

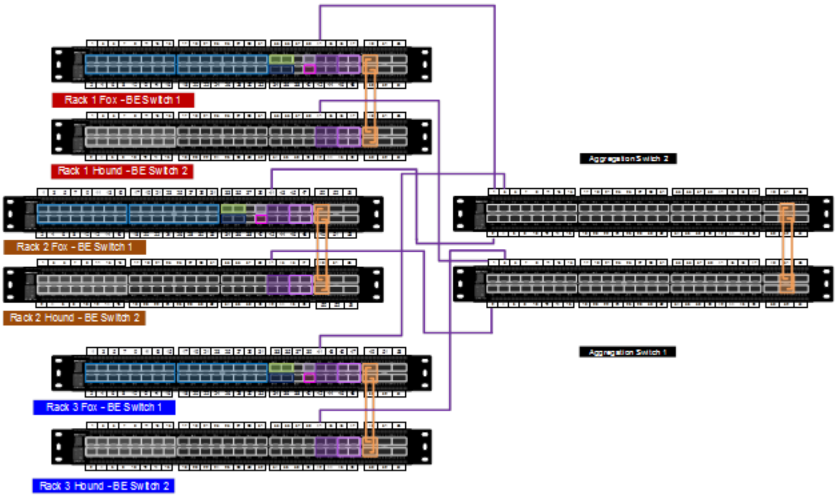

Rack 1 Fox - BE Switch 1
Rack 1 Hound - BE Switch 2
Rack 2 Fox - BE Switch 1
Rack 2 Hound - BE Switch 2
Rack 3 Fox - BE Switch 1
Rack 3 Hound - BE Switch 2
Aggregation Switch 2
Aggregation Switch 1

Figure 21. Inter-rack switch connectivity - star topology

Connecting HDD Clusters to EXF900 Clusters

The private.4 network can now be connected between HDD clusters and EXF900 clusters. If the EXF900 cluster is a single rack or multirack with aggregation, the connection to the EXF900 cluster has to be made only on the first rack of Fox and Hound switches. The aggregation switches are dedicated only for the EXF900 backend traffic.

NOTE: Fox and Hound default switch configuration files are updated in the ECS 3.7 release to enable the private.4 ingress ports (41-44) and egress ports (45-48).

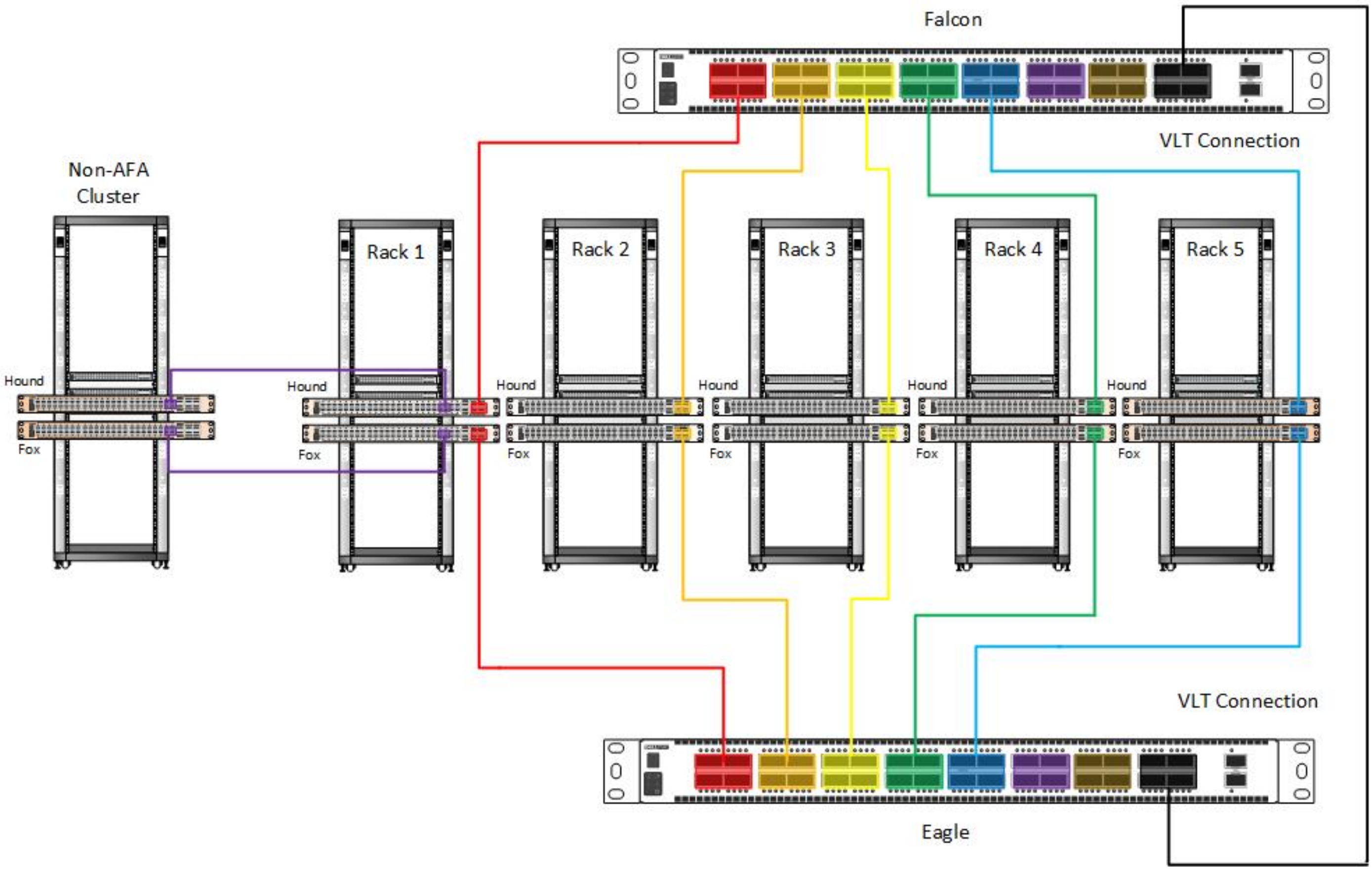

Falcon
VLT Connection
Non-AFA Cluster
Rack 1
Rack 2
Rack 3
Rack 4
Rack 5
Hound
Fox
Hound
Fox
Hound
Fox
Hound
Fox
Hound
Fox
Hound
Fox
VLT Connection
Eagle

Figure 22. HDD to EXF900 private.4 network topology

3

EX5000 Platform

Topics:

- EX5000 hardware components
- EX5000 configurations
- EX5000 upgrade paths
- EX5000 server
- EX5000 disk drives
- EX5000 power cabling
- EX5000 iDRAC cabling
- EX5000 network cabling
- EX5000 Cable Kits

EX5000 hardware components

EX5000 S and D are offered in a Dell Technologies rack from the factory and in third-party rack. EX5000 is shipped with Dell Technologies Titan-S, which is 600 mm wide x 42U high x 1200 mm deep. EX5000 nodes include the following hardware components.

Table 9. EX5000 hardware components

Component	Description
42U Rack	The requirements for Dell-provided racks to accommodate the EX5000 nodes are described in the *ECS EX5000 Third-Party Rack Installation Guide*.
Backend switches for private network connection	● Two Dell Technologies S5248F 25 GbE 1U Ethernet switches with 48 x 25 GbE SFP ports and 4 x 100 GbE uplink ports. ● 2 x 200 GbE VLT cables per HA pair.
Front-end switches for customer public network connection	● Two optional Dell Technologies S5248F 25 GbE 1U Ethernet switches can be obtained for network connection. The customer can also provide their own 25 GbE HA pair for the front end. ● If the customer provides their own front-end switches, they must supply all VLT cables, SFPs, or external connection cables. ● If Dell Technologies S5248F 25 GbE front-end switches are used, then 2 x 200 GbE VLT cables are provided.
Nodes	● Up to seven server chassis in a rack. ● Chassis are in one and two node configurations. (Each server chassis contains either one or two nodes.) ● One-node chassis configuration is called EX5000S. ● Dual-node chassis configuration is called EX5000D. ● Node chassis support 16 TB and 20 TB drives. ● Dual 2400 W Platinum PS (hot swappable) * C20 inlet*
EX5000S	● 5U chassis ○ Lower 1U to contain 1x server sleds and 2x expander modules ○ Top 4U for 100x 3.5" SAS/SATA HDDs (16 TB and 20 TB) ○ Four 7mm drive slots per compute sled ▪ One 960GB RI SATA drive for operating system and ▪ Two 960GB MU SATA drive for caching ● Single XE7440 full-width compute Sled ○ Dual 26 core Cascade Lake CPUs, 192 GB memory

Table 9. EX5000 hardware components (continued)

Component	Description
	■ Xeon Gold 6230 R 26 core/52 thread 35.75 MB L3, 2.1 GHz base, 4.0 GHz Turbo, 150 W ■ 12x16GB RDIMM, 2933MT/s, Dual Rank, x8 data width ○ H730p Controller ■ For operating system and cache drives only ○ 2xHBA355i ■ For data disks only ○ Mellanox ConnectX 4 LX 2x25GbE PCIe NIC card ○ Broadcom BCM57414 2x25GbE OCP2.0 Mezz card ○ iDRAC9 Enterprise
EX5000D	● 5U chassis ○ Lower 1U to contain 2x server sleds and 2x expander modules ○ Top 4U for 100x 3.5" SAS/SATA HDDs (16 TB and 20 TB) ■ Up to 50 disks per compute sled ○ Four 7mm drive slots ■ One 960GB RI SATA drive for operating system per compute sled ■ Two 960GB MU SATA drive for caching per compute sled ● Two XE7420 half-width compute sleds. Each of the half-width compute sleds contains the following configurations: ○ Dual 26 core Cascade Lake CPUs, 192 GB memory ■ Xeon Gold 6230 R 26 core/52 thread 35.75 MB L3, 2.1 GHz base, 4.0 GHz Turbo, 150 W ■ 12x16GB RDIMM, 2933MT/s, Dual Rank, x8 data width ○ H730p Controller ■ For operating system and cache drives only ○ HBA355i ■ For data disks only ○ Mellanox ConnectX 4 LX 2x25GbE PCIe NIC card ○ Broadcom BCM57414 2x25GbE OCP2.0 Mezz card ○ iDRAC9 Enterprise

EX5000 configurations

This section describes the EX5000 ECS appliance configurations.

The front views of an EX5000S appliance and an EX5000D appliance in both Dell Technologies and customer-provided racks with the minimum and maximum node configurations are shown in the following diagrams. There are 18 total SKUs per drive size, all have the same configuration except for their drive load and number of nodes.

EX5000S contains:

- Single blade
- TPM options: China, ROW, none
- Drive load options: 25, 50, 75, or 100

EX5000D contains:

- Dual blades
- TPM options: China, ROW, none
- Drive load options: 50 or 100

NOTE: EX5000S and EX5000D chassis cannot be mixed within a customer-provided rack or Dell 42U rack due to minimum chassis requirements per rack for software data protection. Similarly, 16T B and 20 TB EX5000 cannot be mixed in a rack for software data protection.

- EX5000S contains a single node chassis with 25 to 50 to 75 to 100 drives with 16 TB or 20 TB HDDs.
  - Minimum five nodes are required at deployment and support one-node increments.
  - This appliance is always sold with the backend S5248F Dual Dell 25 Gb Switches.
  - The front-end S5248F Dual Dell 25 Gb Switches are optional.

-
- EX5000D contains dual node chassis with 50 to 100 drives with 16 TB or 20 TB HDDs.
    - Minimum eight nodes (four chassis) are required at deployment and support one-node increments (one chassis).
    - This appliance is always sold with the back-end S5248F Dual Dell 25 Gb Switches.
        - The front-end S5248F Dual Dell 25 Gb Switches are optional.

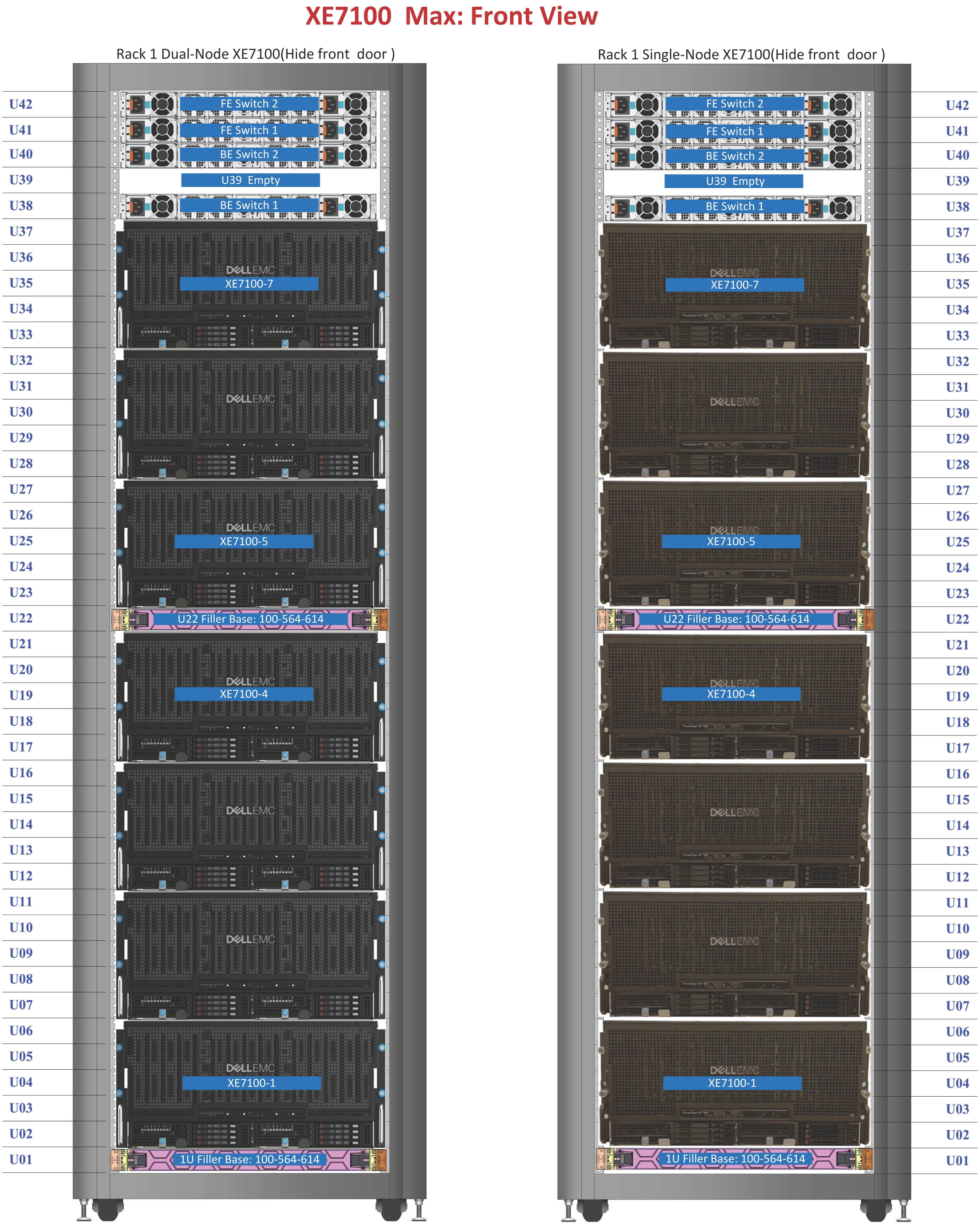

XE7100 Max: Front View
Rack 1 Dual-Node XE7100(Hide front door)
Rack 1 Single-Node XE7100(Hide front door)
FE Switch 2
FE Switch 1
BE Switch 2
U39 Empty
BE Switch 1
DELLEMC
XE7100-7
XE7100-5
U22 Filler Base: 100-564-614
XE7100-4
XE7100-1
1U Filler Base: 100-564-614
U42
U41
U40
U39
U38
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U23
U22
U21
U20
U19
U18
U17
U16
U15
U14
U13
U12
U11
U10
U09
U08
U07
U06
U05
U04
U03
U02
U01

Figure 23. EX5000 maximum configurations for dual and single node chassis

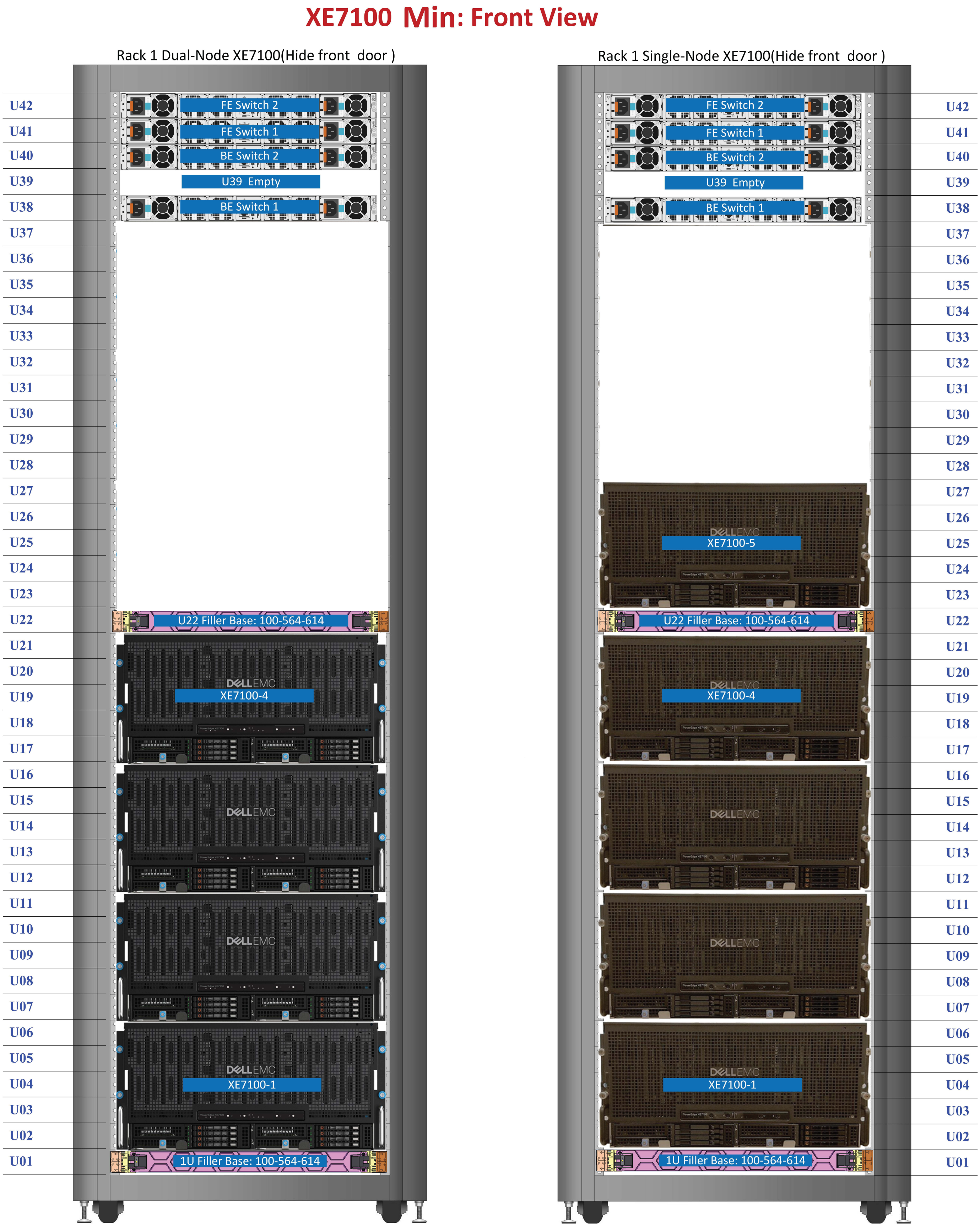

XE7100 Min: Front View
Rack 1 Dual-Node XE7100(Hide front door)
Rack 1 Single-Node XE7100(Hide front door)
U42
U41
U40
U39
U38
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U23
U22
U21
U20
U19
U18
U17
U16
U15
U14
U13
U12
U11
U10
U09
U08
U07
U06
U05
U04
U03
U02
U01
FE Switch 2
FE Switch 1
BE Switch 2
U39 Empty
BE Switch 1
XE7100-5
U22 Filler Base: 100-564-614
XE7100-4
XE7100-1
1U Filler Base: 100-564-614
DELLEMC

Figure 24. EX5000 minimum configurations for dual and single node chassis

The EX5000 appliance is available in the following configurations in both Dell Technologies and customer-provided rack.

Table 10. EX5000S single node chassis configurations

Nodes	Disks in each node	Disk size in TB	RAW storage capacity in PB
5 (minimum configuration)	25	16 TB 20 TB	2 PB 2.5 PB
	50	16 TB 20 TB	4 PB 5 PB
	75	16 TB 20 TB	6 PB 7.5 PB
	100	16 TB 20 TB	8 PB 10 PB
6	25	16 TB 20 TB	2.4 PB 3 PB
	50	16 TB 20 TB	4.8 PB 6 PB
	75	16 TB 20 TB	7.2 PB 9 PB
	100	16 TB 20 TB	9.6 PB 12 PB
7 (maximum configuration)	25	16 TB 20 TB	2.8 PB 3.5 PB
	50	16 TB 20 TB	5.6 PB 7 PB
	75	16 TB 20 TB	8.4 PB 10.5 PB
	100	16 TB 20 TB	11.2 PB 14 PB

Table 11. EX5000D dual node chassis configurations

Nodes	Disks in each node	Disk Size	RAW Storage capacity
8 (minimum configuration)	25	16 TB 20 TB	3.2 PB 4 PB
	50	16 TB 20 TB	6.4 PB 8 PB
10	25	16 TB 20 TB	4 PB 5 PB
	50	16 TB 20 TB	8 PB 10 PB
12	25	16 TB 20 TB	4.8 PB 6 PB
	50	16 TB 20 TB	9.6 PB 12 PB
14 (maximum configuration)	25	16 TB 20 TB	5.6 PB 7 PB
	50	16 TB	11.2 PB

Table 11. EX5000D dual node chassis configurations (continued)

Nodes	Disks in each node	Disk Size	RAW Storage capacity
		• 20 TB	• 14 PB

EX5000 upgrade paths

Describes the EX5000 ECS appliance upgrade paths.

If there are five or more nodes (single node configurations) or eight or more nodes (dual node configurations) in the system (VDC) with the same disk size and disk quantity, the minimum node expansion is one (single node configurations) or 2 (dual node configurations). This upgrade is possible when the expansion node has the same disk size and disk quantity of the existing nodes. For example, you have an EX5000 appliance with five nodes containing 50x16TB disks (800 TB). You can add a single node with 50x16TB disks or a total disk capacity of 800 TB.

If you are adding nodes that have different disk sizes than the nodes currently in the system, you must add a minimum of five nodes at a time (eight for dual node configurations). For example, you have an EX5000 appliance with five nodes containing 50x16TB drives. If you want to add nodes of different drive quantities, you must add five or more nodes (eight or more nodes for dual node configurations), at a time.

NOTE: All drives within a node must be of the same drive size, but there can be nodes of differing drive quantities within a rack.

You can add drives to partially populated EX5000 nodes. The following drive upgrades are supported:

- Convert EX5000S-25 to EX5000S-50 drives.
- Convert EX5000S-50 to EX5000S-75 drives.
- Convert EX5000S-75 to EX5000S-100 drives.
- Convert EX5000D-25 to EX5000D-50 drives (2 kits per chassis).

NOTE: EX5000S single node upgrade kit and EX5000D dual node upgrade kit must match the existing drive population with the servers in the existing VDC.

EX5000 server

This topic describes the features of EX5000 server.

The EX5000 5U server contains the EX5000 chassis and either one server sled (in the EX5000S single node configuration) or two server sleds (in the EX5000D dual node configuration). EX5000 servers have the following standard features:

Table 12. EX5000 Features

Feature	EX5000
Chassis	5U, 100 Drives (16 TB or 20 TB)
Processor (per compute)	Dual Intel Xeon 6230R 150W
Memory per compute	192 GB (12x16GB)
Storage per compute	• Operating system 1x960GB SATA SSD • Cache 2x960GB SATA SSD • Data Up to 100x20TB SATA hard drive (two controllers, 50 drives per controller)
NICs per compute	• BE MLX CX4 2x25Gb PCIe NIC • FE BCM57414 2x25Gb OCP2.0 Mezz NIC
iDRAC per compute	iDRAC9
PSU	2x2400W (C20) - Dual 2400 W Platinum PS (hot swappable) * C20 inlet*
Rack Support	1200 mm (Titan-S)
Rack Density	700 drives per rack

The EX5000 physical dimensions are listed in the following table.

Table 13. EX5000 physical dimensions

Height	219.25 mm (8.63 in.)
Width with rack latches	482.4 mm (18.99 in.)
Width without rack latches	441 mm (17.36 in.)
Depth	913.7 mm (35.97 in.)
Total depth of system with cable management (CMA) arm attached	970.4 mm (38.20 in.)
Weight (maximum)	125.23 Kg (276 lb)

EX5000 disk drives

This section describes the disk drives that are integrated into the server chassis of the EX5000 appliance.

The EX5000 5U chassis contains one or two server sleds, depending on whether the chassis is a single or dual node configuration. Both chassis configurations support the 16 TB and 20 TB SATA disk drives.

In EX5000S single node chassis configurations, there can be 25 to 50 to 75 to 100 drives with 16 TB or 20 TB hard drives per node.

In EX5000D dual node chassis configurations, there can be 50 to 100 drives with 16 TB or 20 TB hard drives per node (50 or 100 drives per chassis).

Drives are drawer accessible and hot-pluggable. There are up to 100 x 3.5" 16 TB or 20 TB 7.2 K RPM 512e 6 Gb/s SATA hard drive in each EX5000 node for customer data. You cannot mix single and dual node chassis within the same rack.

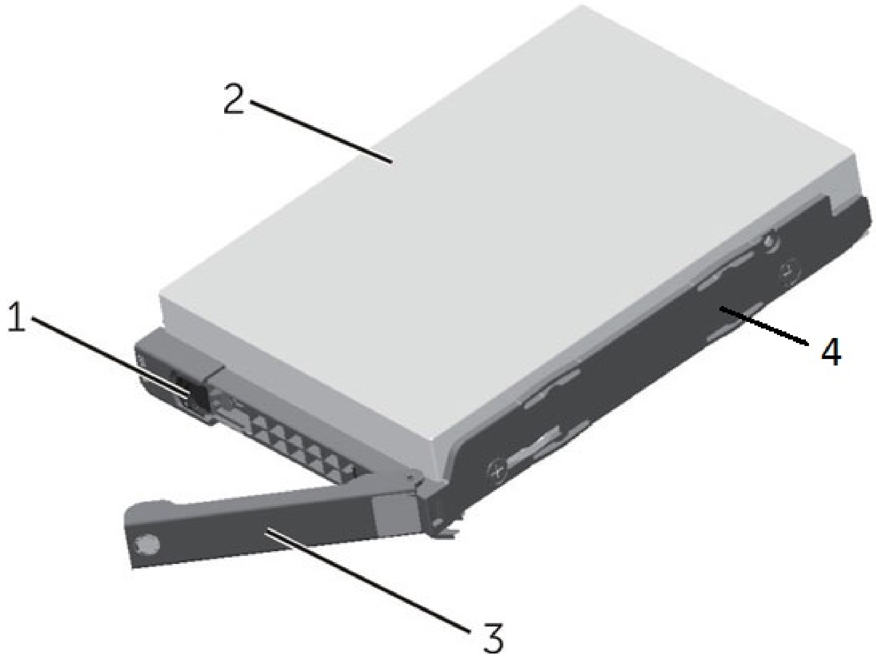


Figure 25. EX5000 disk drive in carrier

1 - Release button

2 - 3.5-inch hard drive

3 - hard drive carrier handle

4 - hard drive carrier

EX5000 power cabling

Provides EX5000S and EX5000D ECS appliance cabling diagrams for single-phase AC power and three-phase delta and WYE AC power.

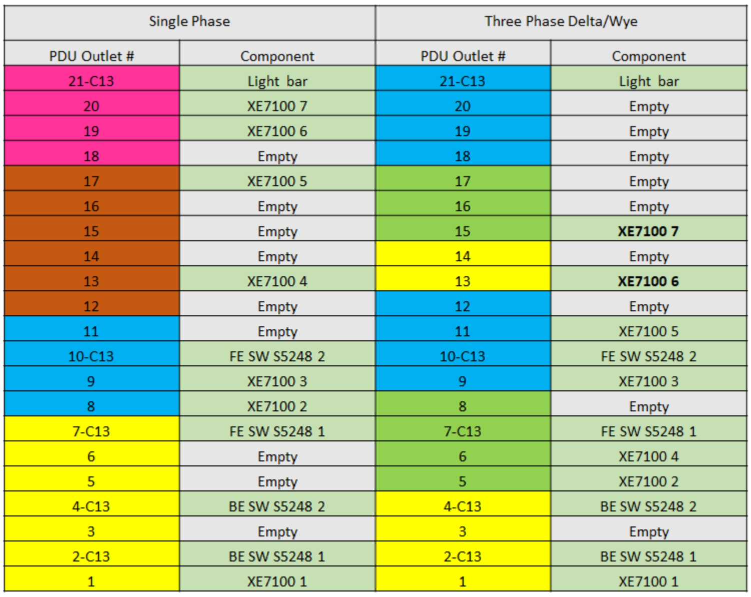
Use the power and weight calculator to refine the power and heat values to more-closely match the hardware configuration for your system. The calculator contains the latest information for power and weight planning.

NOTE: The PDU jumpers are required to be reconfigured prior to installing additional EX5000 chassis systems. You must perform the jumper modification one side at a time in order to keep all the system components powered and running. It is recommended to check all power connections to the ECS equipment prior to jumper modification.

NOTE: The light bar adapter sub has been added. 071-000-210-00 is the sub for 071-000-253-00; 071-000-211-00 is the sub for 071-000-254-00.

The following diagram shows the Gen4 0U PDU's outlet numbers for Zone A and Zone B.

WARNING: Only a trained personnel must pair the PDU AC input cable with the PDU Anderson power input connector. PDU is not a Hot-Swapable unit, so it must disconnect main power before servicing (plugging or removing) input power cable with Anderson connector to the PDU.



Single Phase		Three Phase Delta/Wye	
PDU Outlet #	Component	PDU Outlet #	Component
21-C13	Light bar	21-C13	Light bar
20	XE7100 7	20	Empty
19	XE7100 6	19	Empty
18	Empty	18	Empty
17	XE7100 5	17	Empty
16	Empty	16	Empty
15	Empty	15	**XE7100 7**
14	Empty	14	Empty
13	XE7100 4	13	**XE7100 6**
12	Empty	12	Empty
11	Empty	11	XE7100 5
10-C13	FE SW S5248 2	10-C13	FE SW S5248 2
9	XE7100 3	9	XE7100 3
8	XE7100 2	8	Empty
7-C13	FE SW S5248 1	7-C13	FE SW S5248 1
6	Empty	6	XE7100 4
5	Empty	5	XE7100 2
4-C13	BE SW S5248 2	4-C13	BE SW S5248 2
3	Empty	3	Empty
2-C13	BE SW S5248 1	2-C13	BE SW S5248 1
1	XE7100 1	1	XE7100 1

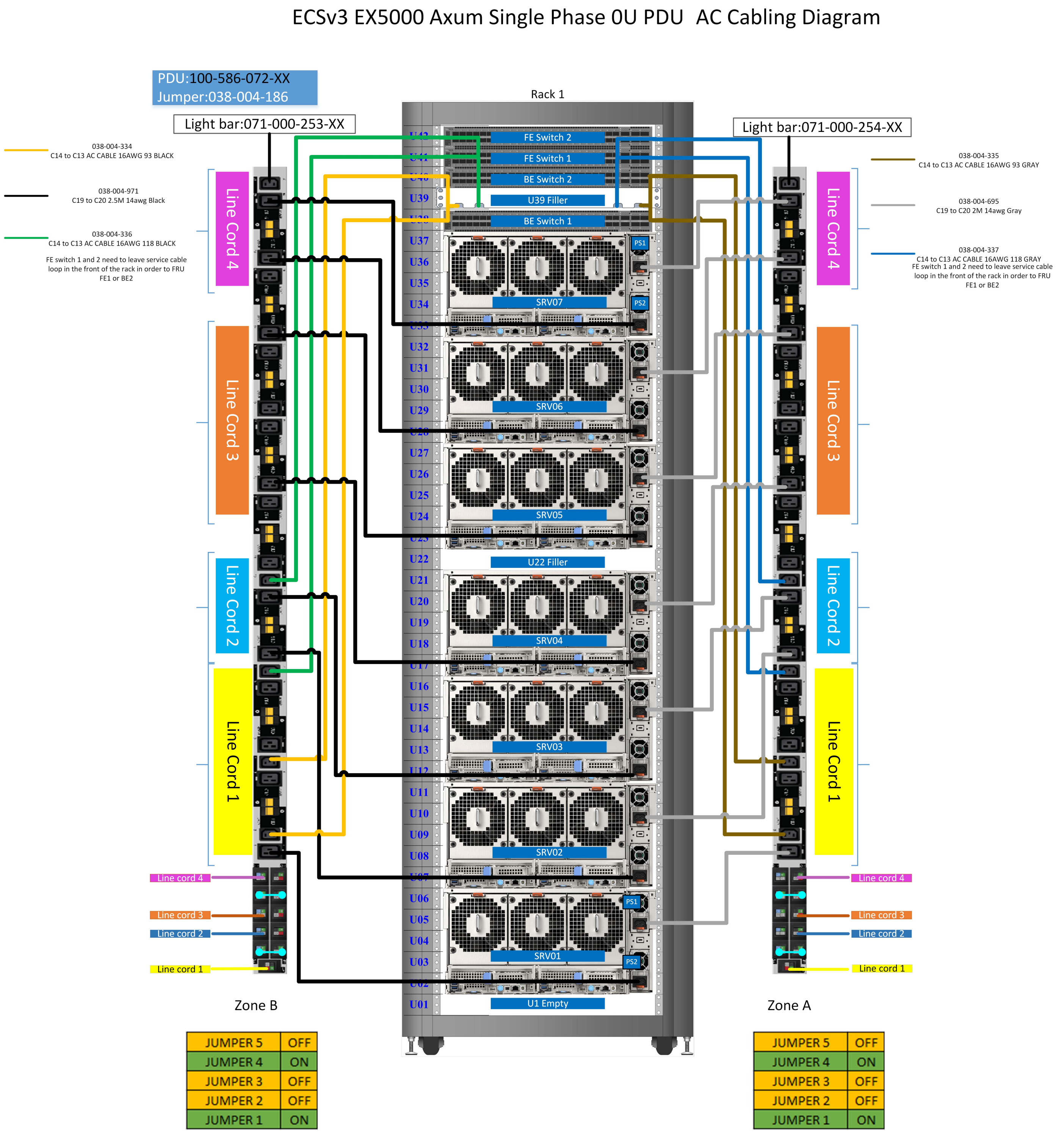
Figure 26. Power PDU Mapping

The EX5000 appliance connections to Gen4 0U PDU's outlets are listed in the following tables.

Single-phase AC power cabling

The front-end switch kits only include 118-inch cable, and back-end kits only include 93-inch cable.

NOTE: The light bar adapter sub has been added. 071-000-210-00 is the sub for 071-000-253-00; 071-000-211-00 is the sub for 071-000-254-00.


ECSv3 EX5000 Axum Single Phase 0U PDU AC Cabling Diagram
PDU:100-586-072-XX
Jumper:038-004-186
Light bar:071-000-253-XX
Rack 1
Light bar:071-000-254-XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
U39
U37
U36
U35
U34
U32
U31
U30
U29
U27
U26
U25
U24
U22
U21
U20
U19
U18
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
PS1
PS2
SRV07
SRV06
SRV05
U22 Filler
SRV04
SRV03
SRV02
PS1
PS2
SRV01
U1 Empty
Line Cord 4
Line Cord 3
Line Cord 2
Line Cord 1
Line Cord 4
Line Cord 3
Line Cord 2
Line Cord 1
Line cord 4
Line cord 3
Line cord 2
Line cord 1
Line cord 4
Line cord 3
Line cord 2
Line cord 1
Zone B
Zone A

Zone B

JUMPER 5	OFF
JUMPER 4	ON
JUMPER 3	OFF
JUMPER 2	OFF
JUMPER 1	ON

Zone A

JUMPER 5	OFF
JUMPER 4	ON
JUMPER 3	OFF
JUMPER 2	OFF
JUMPER 1	ON

Figure 27. EX5000 single-phase AC power cabling

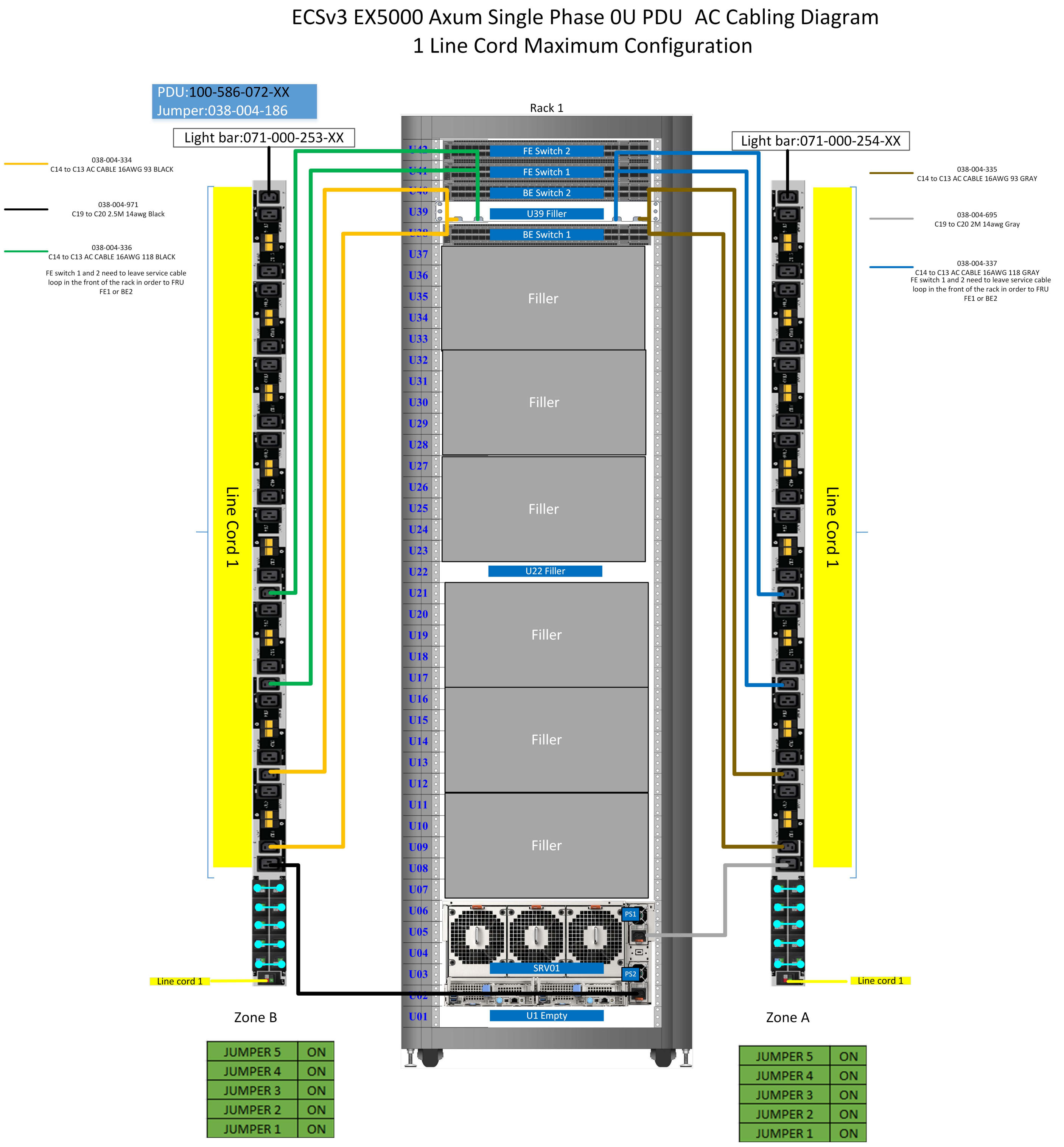
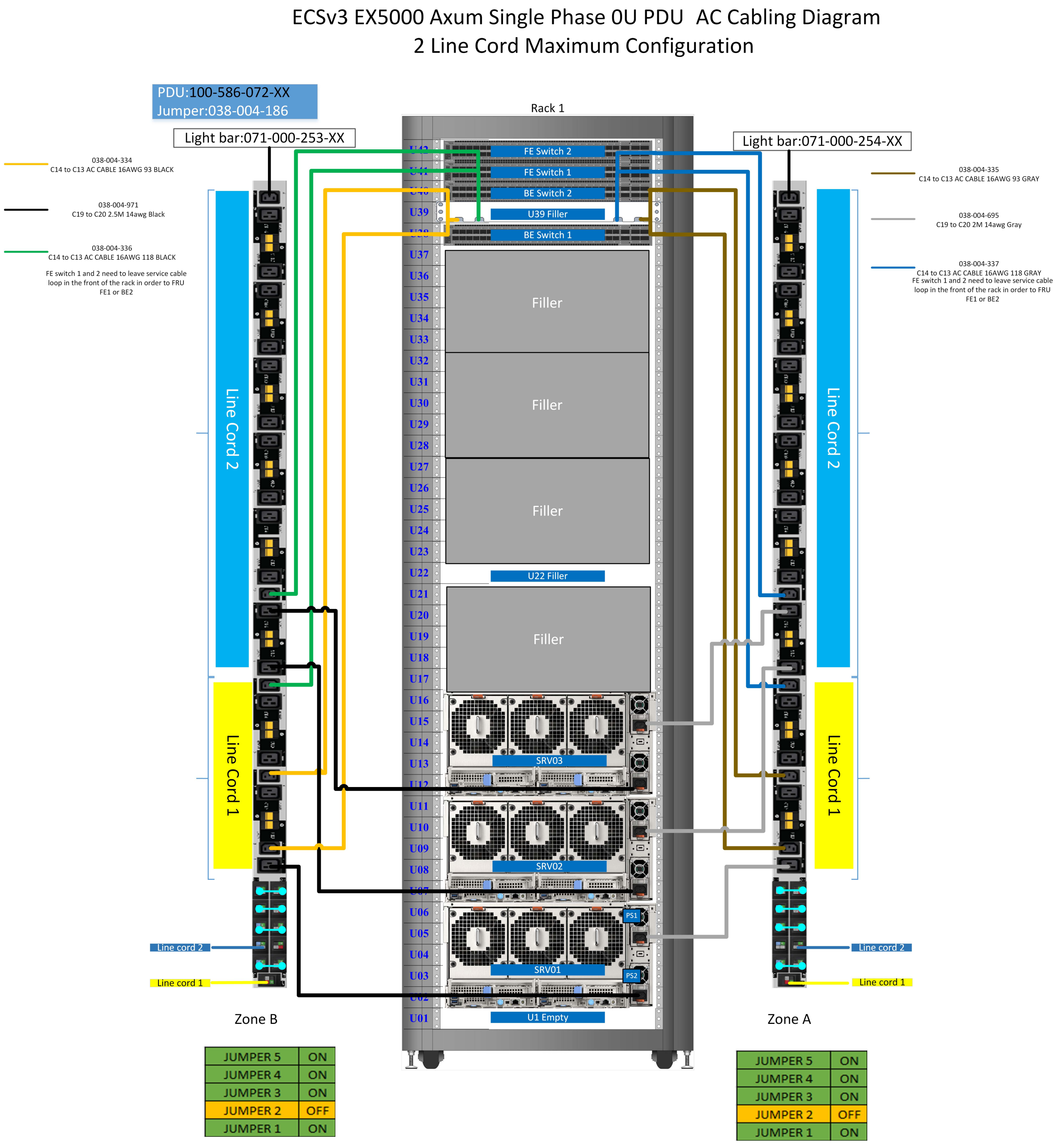

ECSv3 EX5000 Axum Single Phase 0U PDU AC Cabling Diagram
1 Line Cord Maximum Configuration
PDU:100-586-072-XX
Jumper:038-004-186
Light bar:071-000-253-XX
Rack 1
Light bar:071-000-254-XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
Filler
Filler
Filler
U22 Filler
Filler
Filler
Filler
PS1
SRV01
PS2
U1 Empty
U39
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U23
U22
U21
U20
U19
U18
U17
U16
U15
U14
U13
U12
U11
U10
U09
U08
U07
U06
U05
U04
U03
U01
Line Cord 1
Line Cord 1
Line cord 1
Line cord 1
Zone B
Zone A
JUPMER 5 ON
JUMPER 4 ON
JUMPER 3 ON
JUMPER 2 ON
JUMPER 1 ON
JUMPER 5 ON
JUMPER 4 ON
JUMPER 3 ON
JUMPER 2 ON
JUMPER 1 ON

Figure 28. EX5000 single-phase AC power cabling Line 1 cord Maximum Configuration

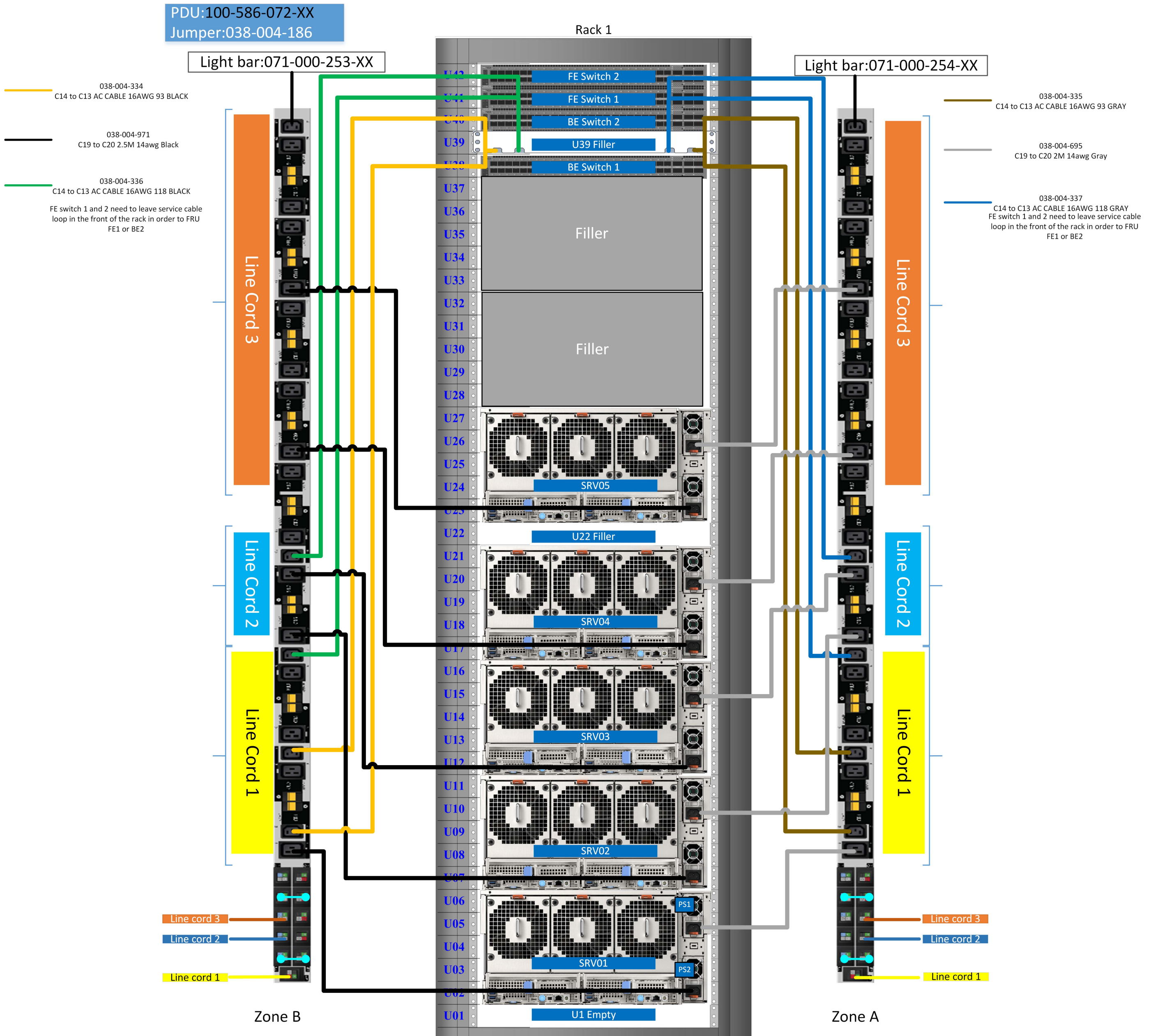

ECSv3 EX5000 Axum Single Phase 0U PDU AC Cabling Diagram
2 Line Cord Maximum Configuration
PDU:100-586-072-XX
Jumper:038-004-186
Light bar:071-000-253-XX
Light bar:071-000-254-XX
Rack 1
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
Filler
Filler
Filler
U22 Filler
Filler
SRV03
SRV02
SRV01
PS1
PS2
U1 Empty
U39
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U23
U22
U21
U20
U19
U18
U17
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
Line Cord 2
Line Cord 1
Line Cord 2
Line Cord 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Zone B
Zone A

JUMPER 5	ON
JUMPER 4	ON
JUMPER 3	ON
JUMPER 2	OFF
JUMPER 1	ON

JUMPER 5	ON
JUMPER 4	ON
JUMPER 3	ON
JUMPER 2	OFF
JUMPER 1	ON

Figure 29. EX5000 single-phase AC power cabling Line 2 cord Maximum Configuration

ECSv3 EX5000 Axum Single Phase 0U PDU AC Cabling Diagram
3 Line Cord Maximum Configuration


PDU:100-586-072-XX
Jumper:038-004-186
Light bar:071-000-253-XX
Rack 1
Light bar:071-000-254-XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
Filler
Filler
SRV05
U22 Filler
SRV04
SRV03
SRV02
PS1
SRV01
PS2
U1 Empty
U42
U41
U40
U39
U38
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U23
U22
U21
U20
U19
U18
U17
U16
U15
U14
U13
U12
U11
U10
U09
U08
U07
U06
U05
U04
U03
U02
U01
Line Cord 3
Line Cord 2
Line Cord 1
Line Cord 3
Line Cord 2
Line Cord 1
Line cord 3
Line cord 2
Line cord 1
Line cord 3
Line cord 2
Line cord 1
Zone B
Zone A

JUMPER 5	ON
JUMPER 4	ON
JUMPER 3	OFF
JUMPER 2	OFF
JUMPER 1	ON

JUMPER 5	ON
JUMPER 4	ON
JUMPER 3	OFF
JUMPER 2	OFF
JUMPER 1	ON

Figure 30. EX5000 single-phase AC power cabling Line 3 cord Maximum Configuration

Three-phase AC power cabling

The legends in the following diagrams map colored cables to part numbers and cable lengths.

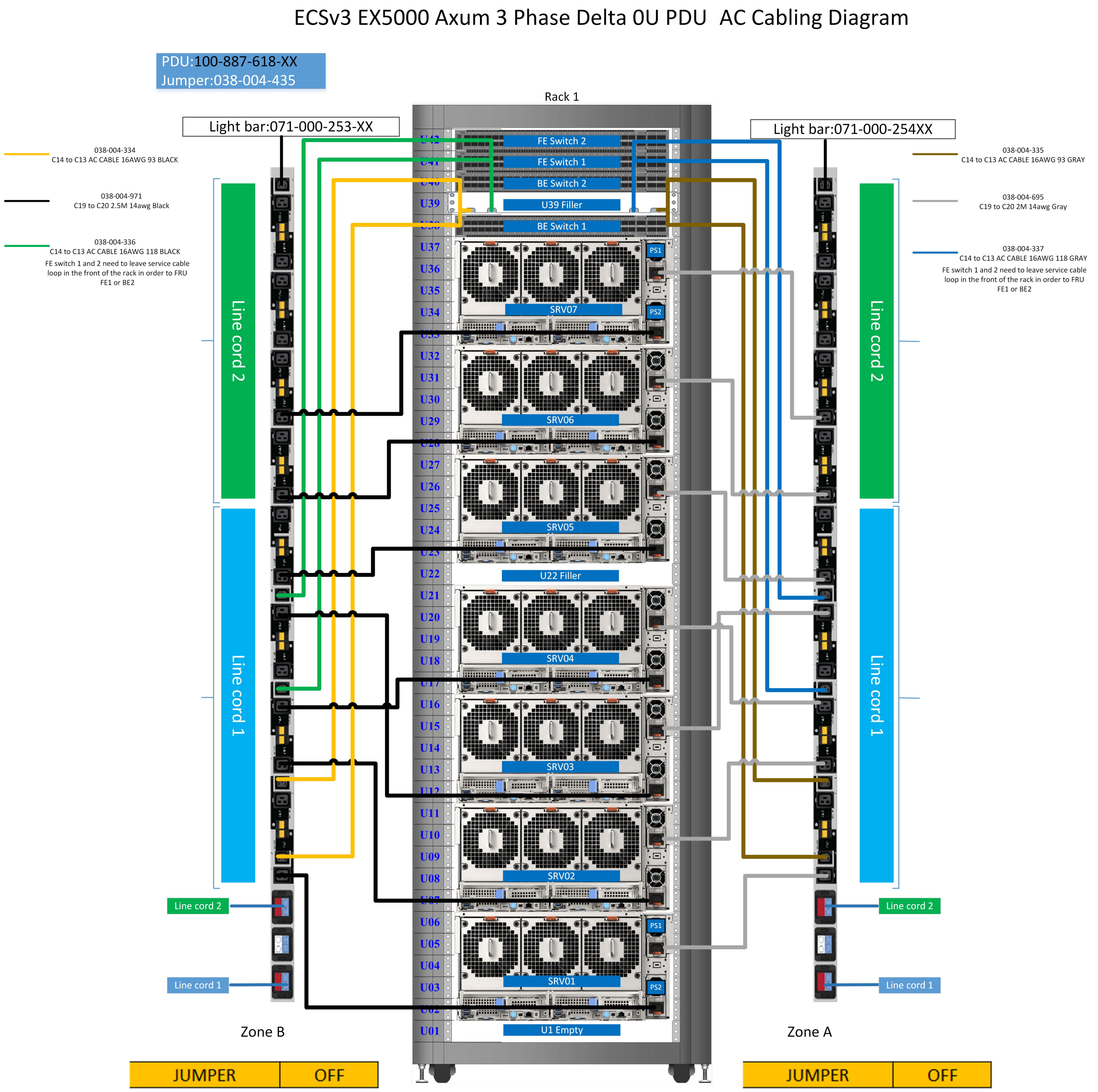

ECSv3 EX5000 Axum 3 Phase Delta 0U PDU AC Cabling Diagram
PDU:100-887-618-XX
Jumper:038-004-435
Rack 1
Light bar:071-000-253-XX
Light bar:071-000-254XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
SRV07
SRV06
SRV05
U22 Filler
SRV04
SRV03
SRV02
SRV01
U1 Empty
PS1
PS2
U42
U41
U40
U39
U37
U36
U35
U34
U32
U31
U30
U29
U27
U26
U25
U24
U22
U21
U20
U19
U18
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Zone B
Zone A
JUMPER
OFF
JUMPER
OFF

Figure 31. EX5000 three-phase delta AC power cabling

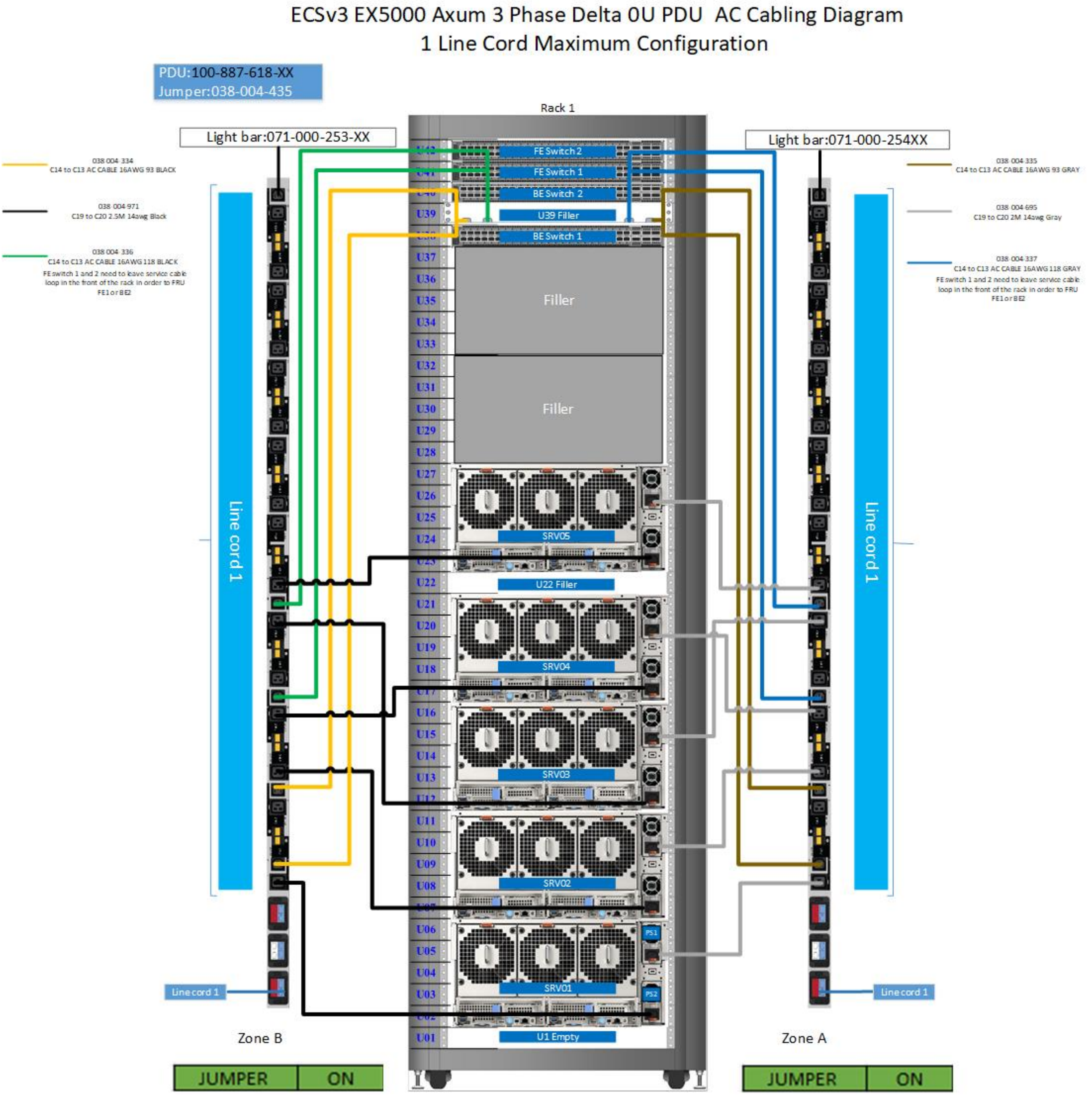

ECSv3 EX5000 Axum 3 Phase Delta 0U PDU AC Cabling Diagram
1 Line Cord Maximum Configuration
PDU:100-887-618-XX
Jumper:038-004-435
Rack 1
Light bar:071-000-253-XX
Light bar:071-000-254XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
Filler
Filler
SRV05
U22 Filler
SRV04
SRV03
SRV02
SRV01
PS1
PS2
U1 Empty
U39
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U22
U21
U20
U19
U18
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
Line cord 1
Line cord 1
Line cord 1
Line cord 1
Zone B
Zone A
JUMPER
ON
JUMPER
ON

Figure 32. EX5000 three-phase delta AC power cabling Line 1 cord Maximum Configuration

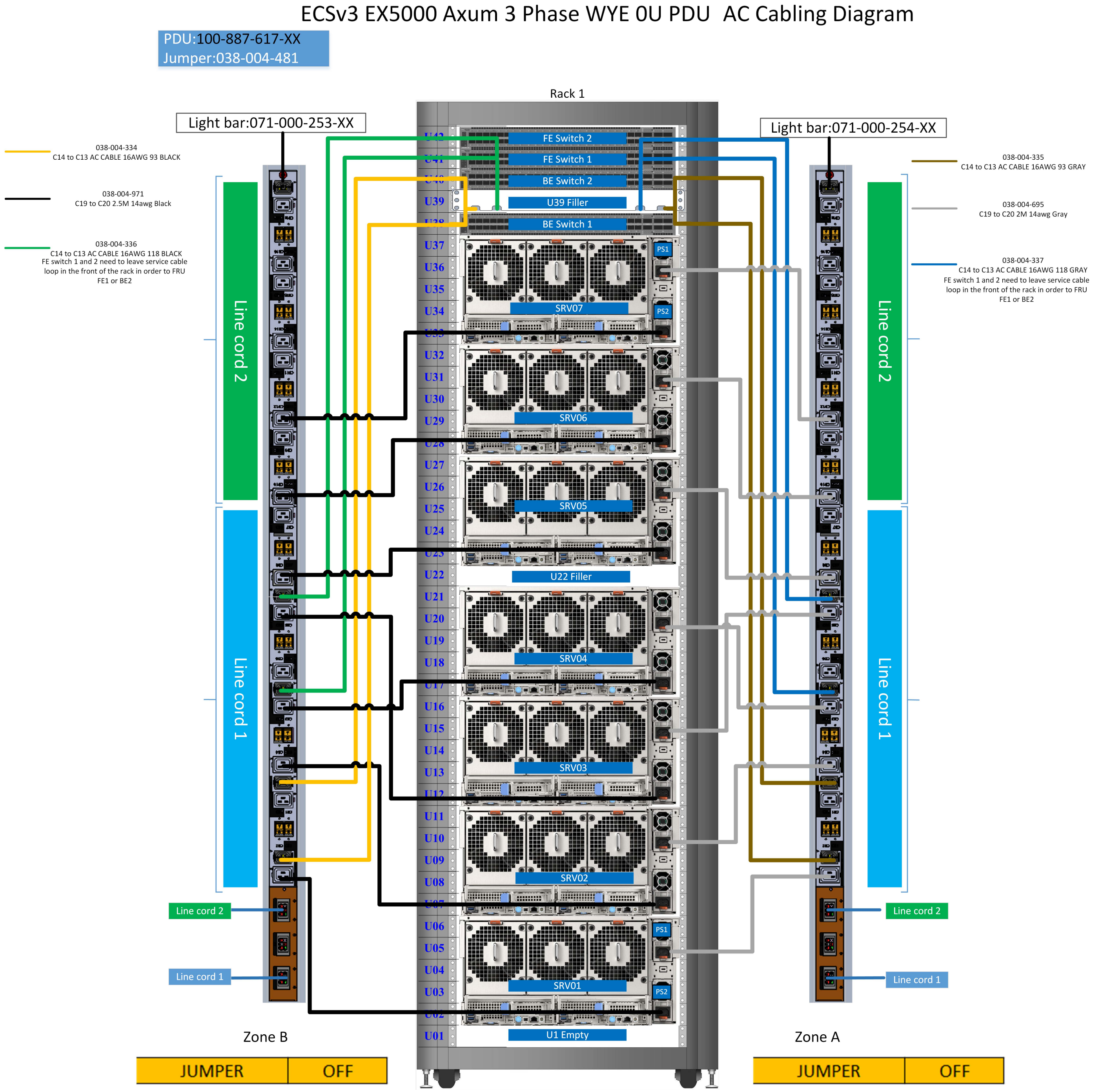

ECSv3 EX5000 Axum 3 Phase WYE 0U PDU AC Cabling Diagram
PDU:100-887-617-XX
Jumper:038-004-481
Rack 1
Light bar:071-000-253-XX
Light bar:071-000-254-XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
SRV07
SRV06
SRV05
U22 Filler
SRV04
SRV03
SRV02
SRV01
U1 Empty
PS1
PS2
U39
U37
U36
U35
U34
U32
U31
U30
U29
U27
U26
U25
U24
U22
U21
U20
U19
U18
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Zone B
Zone A
JUMPER
OFF
JUMPER
OFF

Figure 33. EX5000 three-phase WYE AC power cabling

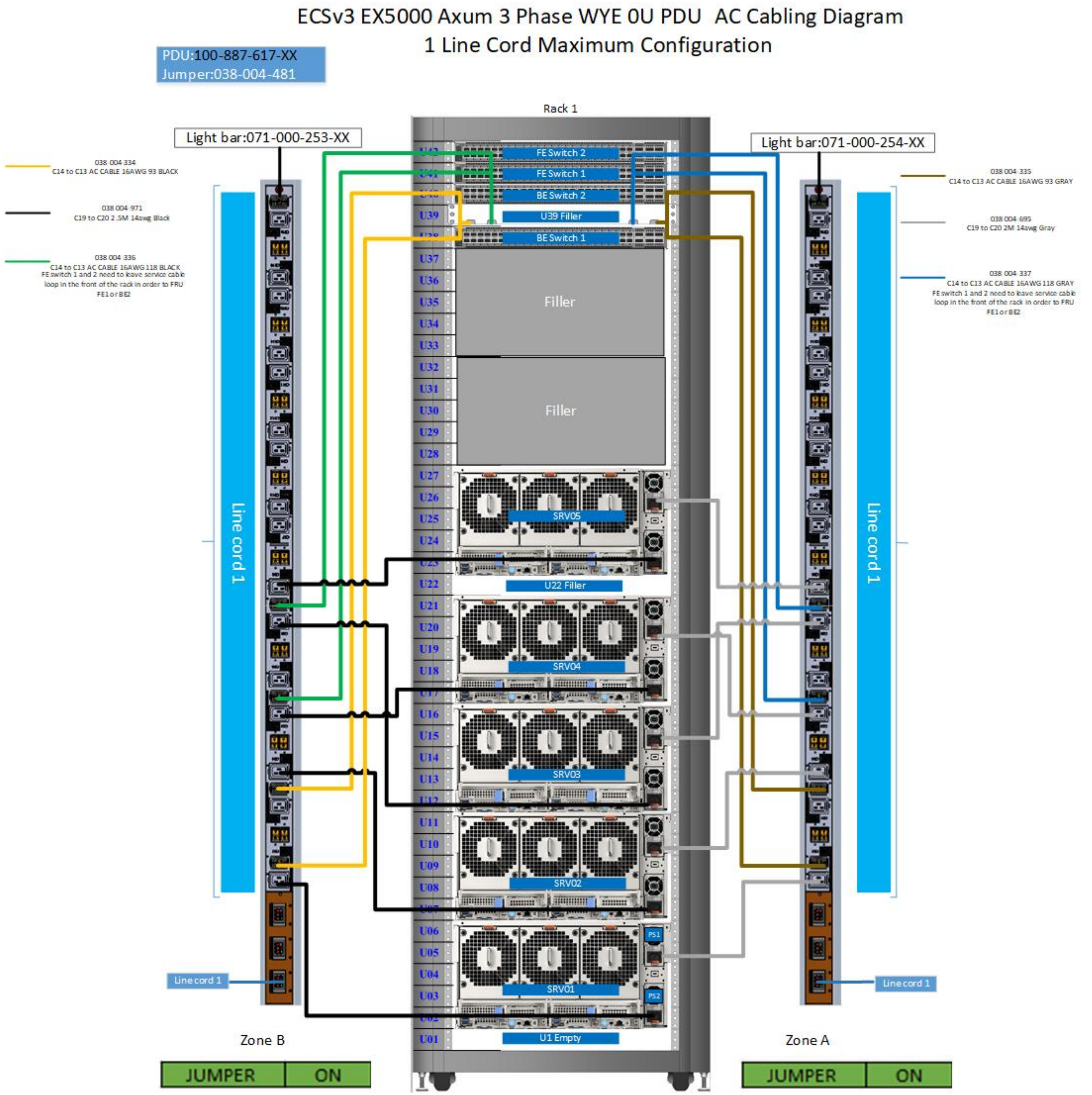

ECSv3 EX5000 Axum 3 Phase WYE 0U PDU AC Cabling Diagram
1 Line Cord Maximum Configuration
PDU:100-887-617-XX
Jumper:038-004-481
Rack 1
Light bar:071-000-253-XX
Light bar:071-000-254-XX
038 004 334
C14 to C13 AC CABLE 16AWG 93 BLACK
038 004 971
C19 to C20 2.5M 14awg Black
038 004 336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038 004 335
C14 to C13 AC CABLE 16AWG 93 GRAY
038 004 695
C19 to C20 2M 14awg Gray
038 004 337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
Filler
Filler
SRV05
U22 Filler
SRV04
SRV03
SRV02
SRV01
PS1
PS2
U1 Empty
U39
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U22
U21
U20
U19
U18
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
Line cord 1
Line cord 1
Line cord 1
Line cord 1
Zone B
Zone A
JUMPER
ON
JUMPER
ON

Figure 34. EX5000 three-phase WYE AC power cabling Line 1 cord Maximum Configuration

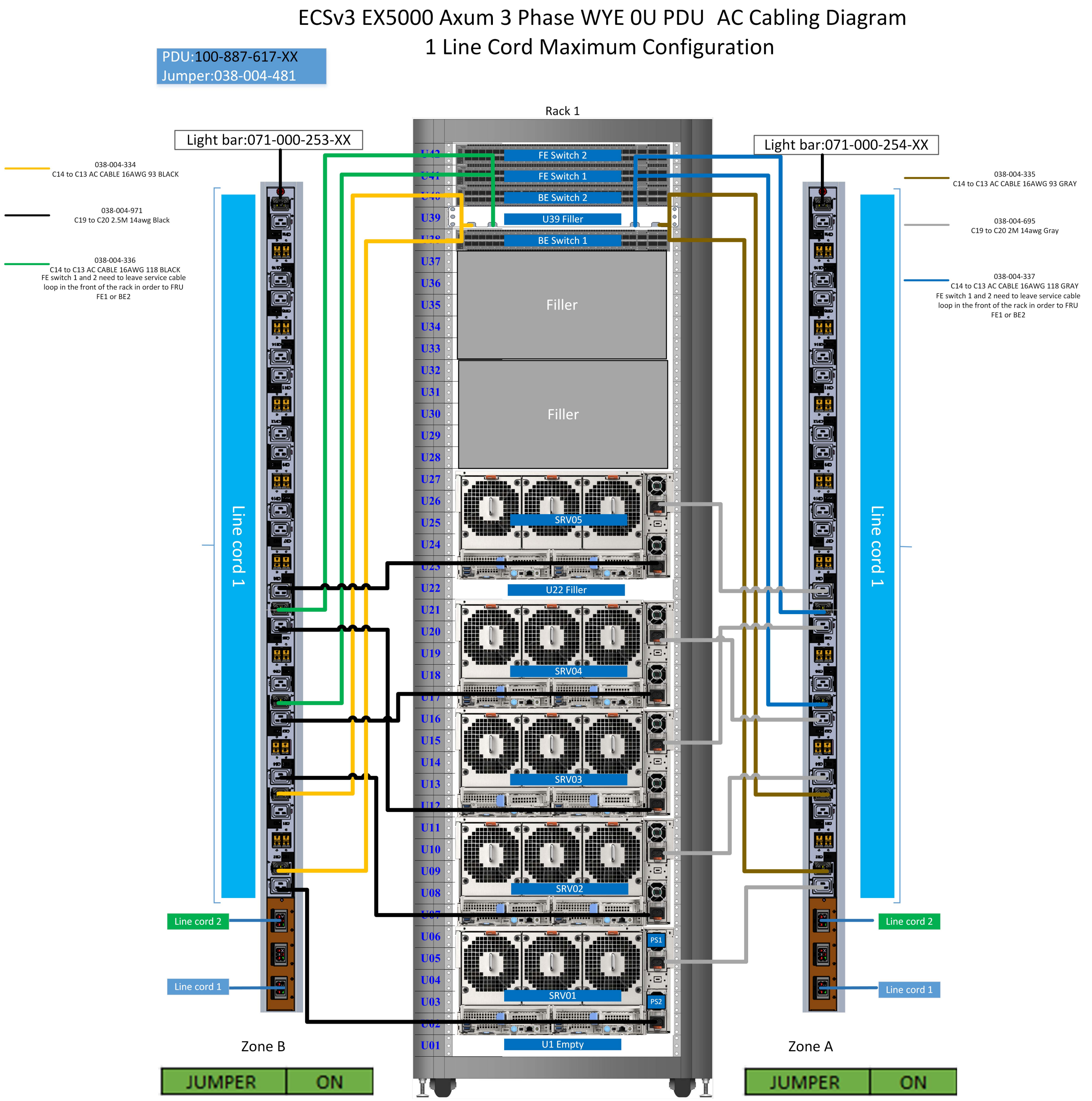

ECSv3 EX5000 Axum 3 Phase WYE 0U PDU AC Cabling Diagram
1 Line Cord Maximum Configuration
PDU:100-887-617-XX
Jumper:038-004-481
Rack 1
Light bar:071-000-253-XX
Light bar:071-000-254-XX
038-004-334
C14 to C13 AC CABLE 16AWG 93 BLACK
038-004-971
C19 to C20 2.5M 14awg Black
038-004-336
C14 to C13 AC CABLE 16AWG 118 BLACK
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
038-004-335
C14 to C13 AC CABLE 16AWG 93 GRAY
038-004-695
C19 to C20 2M 14awg Gray
038-004-337
C14 to C13 AC CABLE 16AWG 118 GRAY
FE switch 1 and 2 need to leave service cable loop in the front of the rack in order to FRU FE1 or BE2
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
Filler
Filler
SRV05
U22 Filler
SRV04
SRV03
SRV02
PS1
SRV01
PS2
U1 Empty
U39
U37
U36
U35
U34
U33
U32
U31
U30
U29
U28
U27
U26
U25
U24
U22
U21
U20
U19
U18
U16
U15
U14
U13
U11
U10
U09
U08
U06
U05
U04
U03
U01
Line cord 1
Line cord 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
Zone B
Zone A
JUMPER
ON
JUMPER
ON

Figure 35. EX5000 three-phase WYE AC power cabling Line 1 cord Maximum Configuration

]

EX5000 iDRAC cabling

This section provides wiring diagrams for the iDRAC cables that connect the iDRAC port on the node to the Fox back-end switch for the EX5000S system (single node chassis configuration) and the EX5000D system (dual node chassis configuration).

The EX5000S node iDRAC port to the Fox switch (BE1) port connections are listed in the following table.

Table 14. EX5000S node iDRAC port to BE1 port mapping

Node 1 iDRAC port	BE1 Port 17
Node 2 iDRAC port	BE1 Port 18
Node 3 iDRAC port	BE1 Port 19
Node 4 iDRAC port	BE1 Port 20
Node 5 iDRAC port	BE1 Port 21
Node 6 iDRAC port	BE1 Port 22
Node 7 iDRAC port	BE1 Port 23

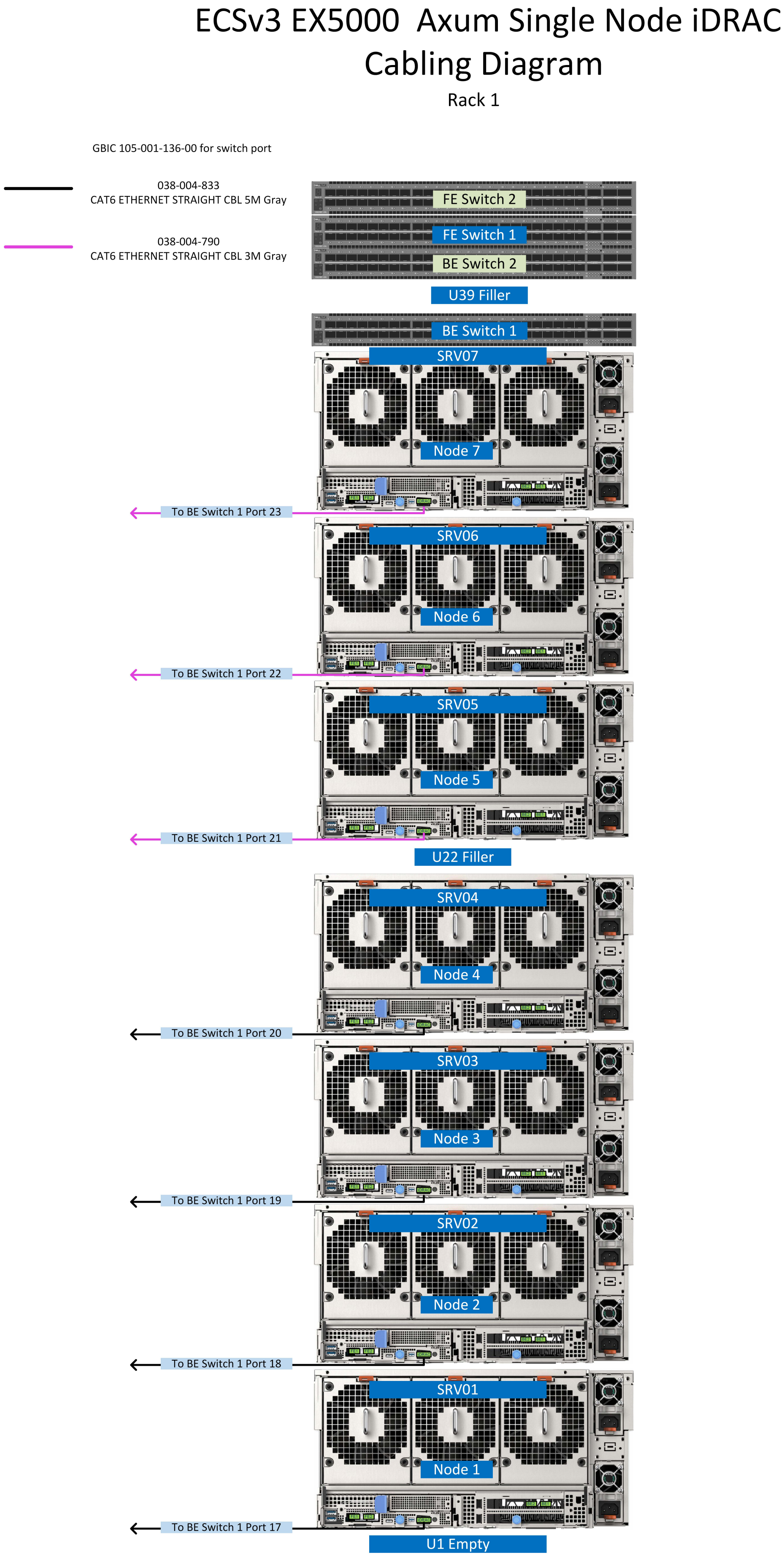

ECSv3 EX5000 Axum Single Node iDRAC Cabling Diagram
Rack 1
GBIC 105-001-136-00 for switch port
038-004-833
CAT6 ETHERNET STRAIGHT CBL 5M Gray
038-004-790
CAT6 ETHERNET STRAIGHT CBL 3M Gray
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
SRV07
Node 7
To BE Switch 1 Port 23
SRV06
Node 6
To BE Switch 1 Port 22
SRV05
Node 5
To BE Switch 1 Port 21
U22 Filler
SRV04
Node 4
To BE Switch 1 Port 20
SRV03
Node 3
To BE Switch 1 Port 19
SRV02
Node 2
To BE Switch 1 Port 18
SRV01
Node 1
To BE Switch 1 Port 17
U1 Empty

Figure 36. EX5000S single node iDRAC cabling

The EX5000D node iDRAC port to the Fox switch (BE1) port connections are listed in the following table.

Table 15. EX5000D dual node iDRAC port to BE1 port mapping

Node 1 iDRAC port (chassis 1)	BE1 Port 17
Node 2 iDRAC port (chassis 1)	BE1 Port 18
Node 3 iDRAC port (chassis 2)	BE1 Port 19
Node 4 iDRAC port (chassis 2)	BE1 Port 20
Node 5 iDRAC port (chassis 3)	BE1 Port 21
Node 6 iDRAC port (chassis 3)	BE1 Port 22
Node 7 iDRAC port (chassis 4)	BE1 Port 23
Node 8 iDRAC port (chassis 4)	BE1 Port 24
Node 9 iDRAC port (chassis 5)	BE1 Port 25
Node 10 iDRAC port (chassis 5)	BE1 Port 26
Node 11 iDRAC port (chassis 6)	BE1 Port 27
Node 12 iDRAC port (chassis 6)	BE1 Port 28
Node 13 iDRAC port (chassis 7)	BE1 Port 29
Node 14 iDRAC port (chassis 7)	BE1 Port 30

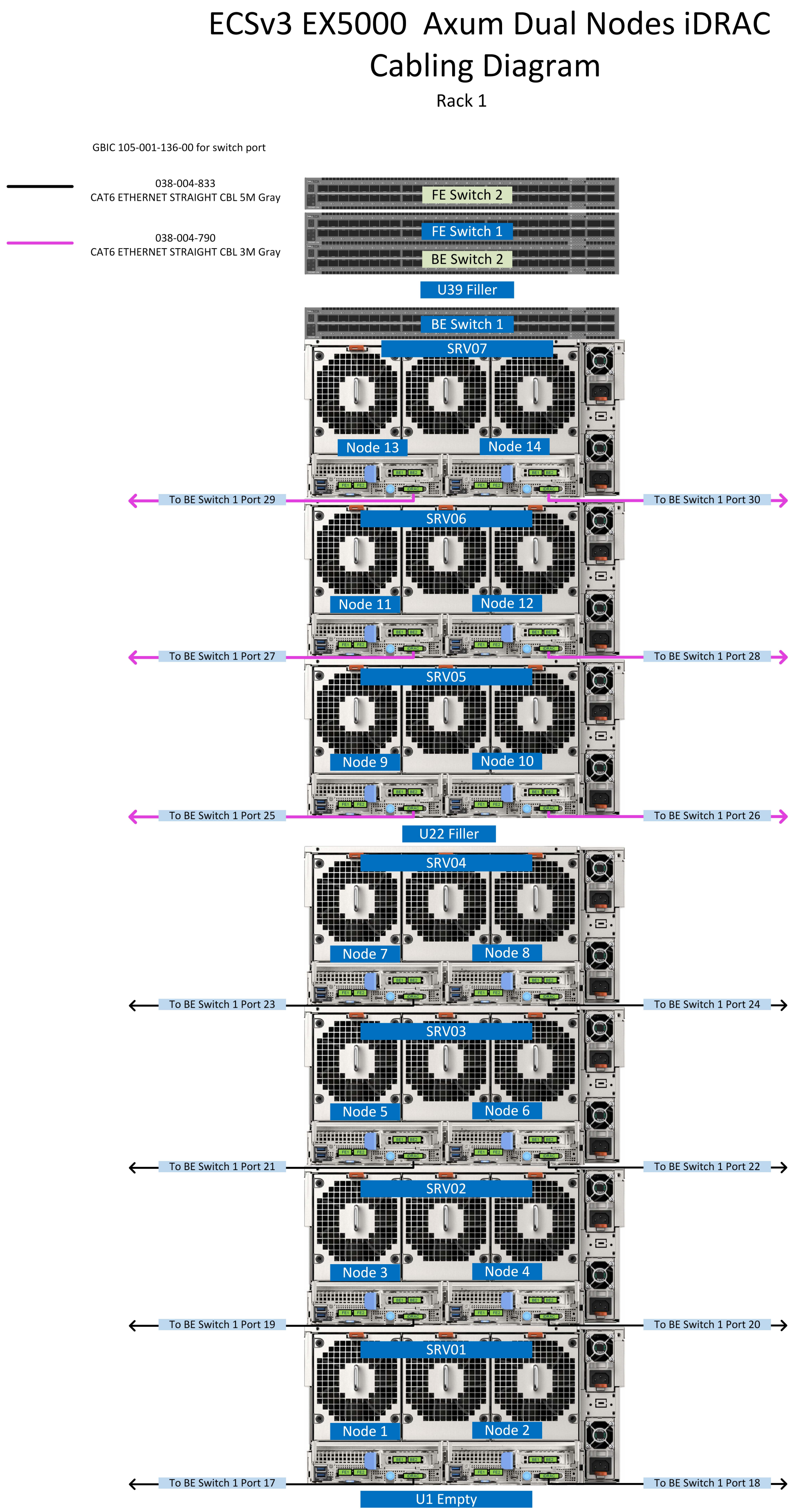

ECSv3 EX5000 Axum Dual Nodes iDRAC Cabling Diagram
Rack 1
GBIC 105-001-136-00 for switch port
038-004-833
CAT6 ETHERNET STRAIGHT CBL 5M Gray
038-004-790
CAT6 ETHERNET STRAIGHT CBL 3M Gray
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
SRV07
Node 13
Node 14
To BE Switch 1 Port 29
To BE Switch 1 Port 30
SRV06
Node 11
Node 12
To BE Switch 1 Port 27
To BE Switch 1 Port 28
SRV05
Node 9
Node 10
To BE Switch 1 Port 25
To BE Switch 1 Port 26
U22 Filler
SRV04
Node 7
Node 8
To BE Switch 1 Port 23
To BE Switch 1 Port 24
SRV03
Node 5
Node 6
To BE Switch 1 Port 21
To BE Switch 1 Port 22
SRV02
Node 3
Node 4
To BE Switch 1 Port 19
To BE Switch 1 Port 20
SRV01
Node 1
Node 2
To BE Switch 1 Port 17
To BE Switch 1 Port 18
U1 Empty

Figure 37. EX5000D dual node iDRAC cabling

EX5000 network cabling

The network cabling diagrams apply to the EX5000 appliance in a Dell Technologies or customer-provided rack.

Customers connect to an EX5000 appliance by way of 25 GbE ports on the front-end switches. For an EX5000 appliance, the 25GbE ports run at 25GbE. Customer configurations can include 25 GbE front-end switches provided by Dell Technologies or customers may provide their own front-end switches.

To distinguish between the two front-end switches and the two back-end switches, each switch has a nickname:

- Hare: The top S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX5000 nodes.
- Rabbit: The bottom S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX5000 nodes.
- Hound: The top S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX5000 nodes.
- Fox: The bottom S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX5000 nodes.

The front-end switch and back-end switch connections to an EX5000 node are shown in the following diagram.

The numbered front-end switch ports used for connecting to the ports on the EX5000 nodes are shown in the following diagram. Port 1 on the Hare switch (FE2) connects to port 4 on Node 1. Port 2 on the Hare switch (FE2) connects to port 4 on Node 2, and so on. Similarly, Port 1 on the Rabbit switch (FE1) connects to port 3 on Node 1. Port 2 on the Rabbit switch (FE1) connects to port 3 on Node 2, and so on.

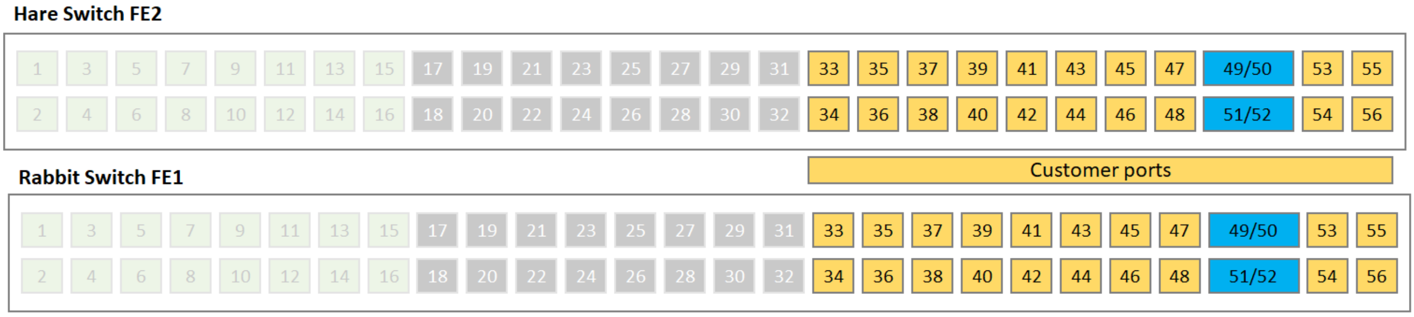
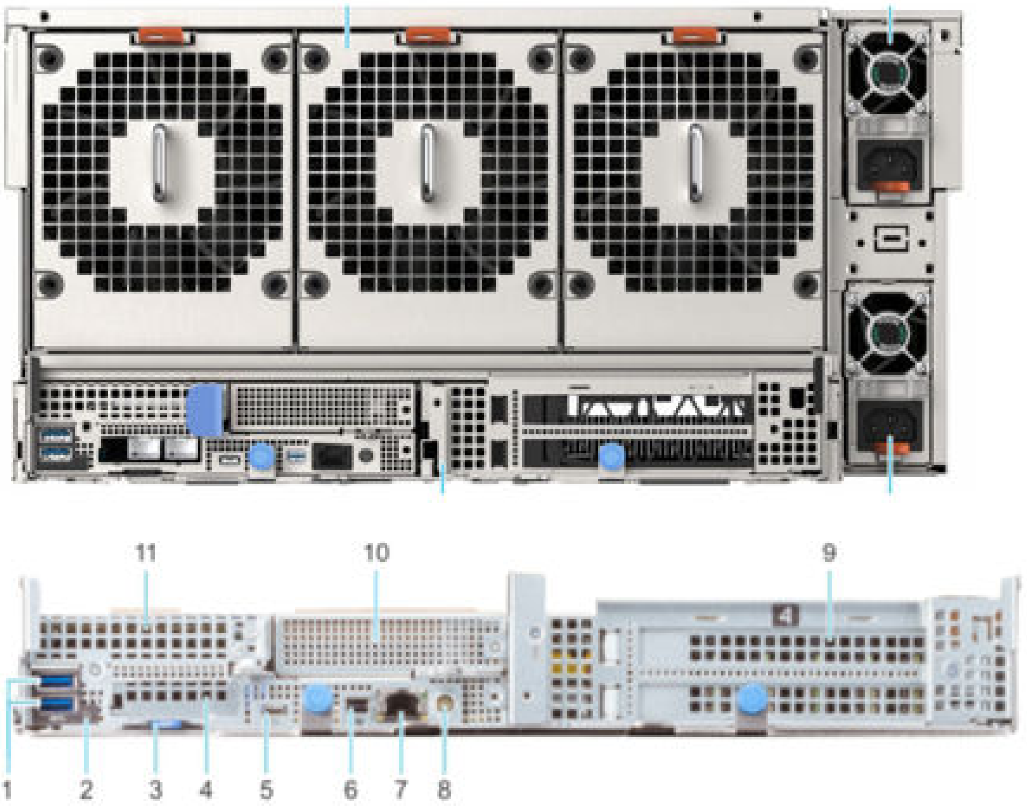

Hare Switch FE2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56
Customer ports
Rabbit Switch FE1
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56

Figure 38. Node ports on front-end switches

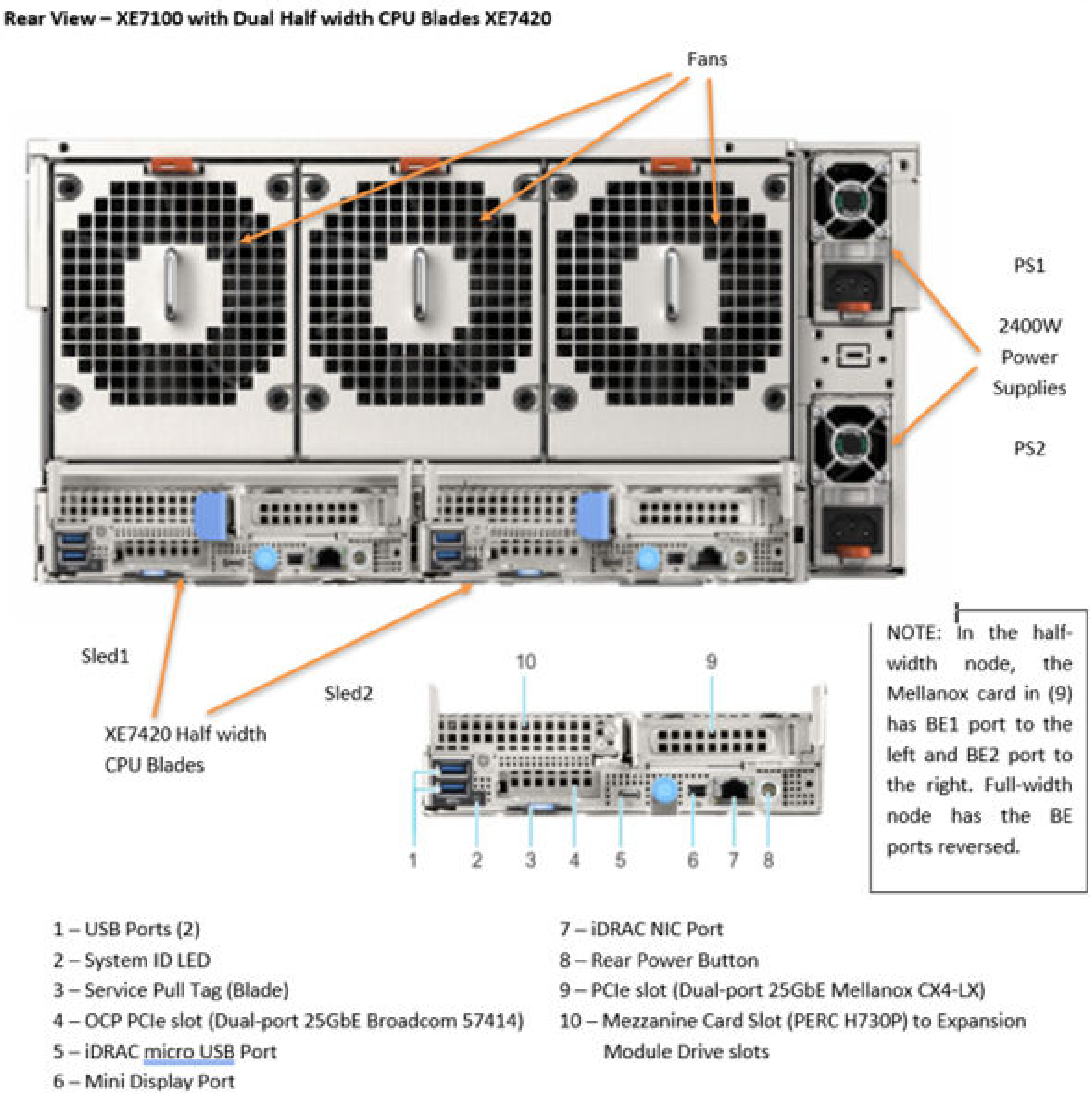
Rear View – XE7100 with Single Full width CPU Blade XE7440



NOTE: In this node, the Mellanox card (9) has BE2 port to the left and BE1 port to the right. Full-width node has the BE ports reversed compared with the half-width node.

1 – USB Ports (2)
2 – System ID LED
3 – Service Pull Tag (Blade)
4 – OCP PCIe slot (Dual-port 25GbE Broadcom 57414)
5 – iDRAC micro USB Port
6 – Mini Display Port
7 – iDRAC NIC Port
8 – Rear Power Button
9 – DW PCIe slot (Dual-port 25GbE Mellanox CX4-LX)
10 – PCIe slot (PCIe bridge)
11 – Mezzanine Card Slot (PERC H730P) to Expansion Module Drive slots

Figure 39. Back-end switch, front-end switch, and iDRAC ports on an EX5000S node



Rear View – XE7100 with Dual Half width CPU Blades XE7420

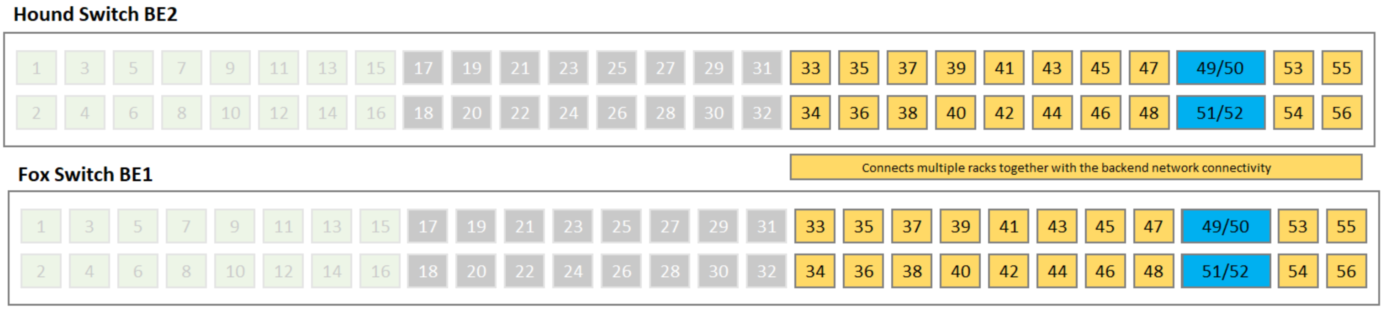
Fans
PS1
2400W Power Supplies
PS2
Sled1
Sled2
XE7420 Half width CPU Blades
10
9
1
2
3
4
5
6
7
8

NOTE: In the half-width node, the Mellanox card in (9) has BE1 port to the left and BE2 port to the right. Full-width node has the BE ports reversed.

1 – USB Ports (2)
2 – System ID LED
3 – Service Pull Tag (Blade)
4 – OCP PCIe slot (Dual-port 25GbE Broadcom 57414)
5 – iDRAC micro USB Port
6 – Mini Display Port
7 – iDRAC NIC Port
8 – Rear Power Button
9 – PCIe slot (Dual-port 25GbE Mellanox CX4-LX)
10 – Mezzanine Card Slot (PERC H730P) to Expansion Module Drive slots

Figure 40. Back-end switch, front-end switch, and iDRAC ports on an EX5000D node

The numbered back-end switch ports used for connecting to the ports on the EX5000 nodes are shown in the following diagram. Port 1 on the Hound switch (BE2) connects to port 2 on Node 1. Port 2 on the Hound switch (BE2) connects to port 2 on Node 2, and so on. Similarly, Port 1 on the Fox switch (BE1) connects to port 1 on Node 1. Port 2 on the Fox switch (BE1) connects to port 1 on Node 2, and so on.



Hound Switch BE2

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Connects multiple racks together with the backend network connectivity

Fox Switch BE1

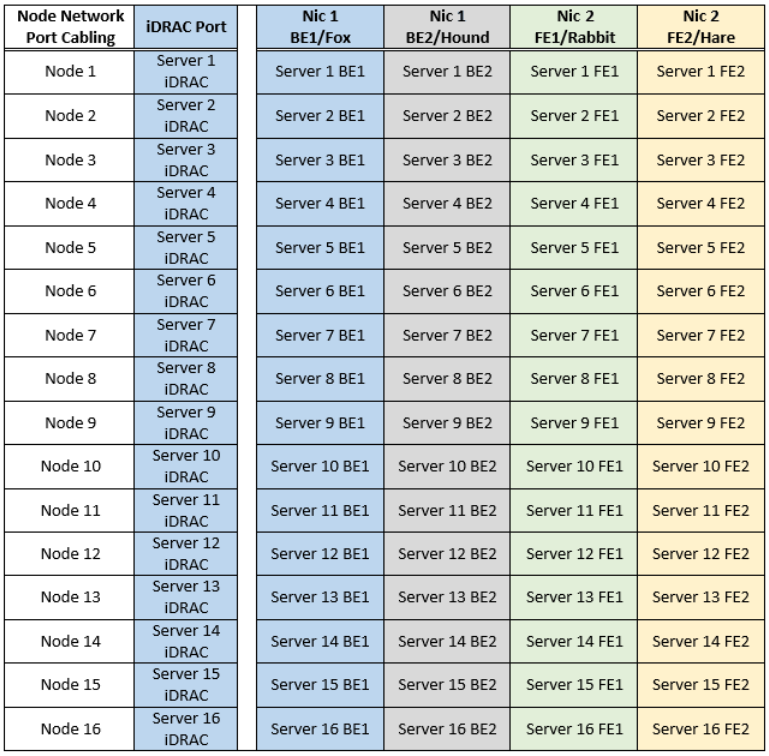
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Figure 41. Node ports on back-end switches

The EX5000 node port to the iDRAC, back-end switch, and front-end switch port connections are listed in the following table.

NOTE:

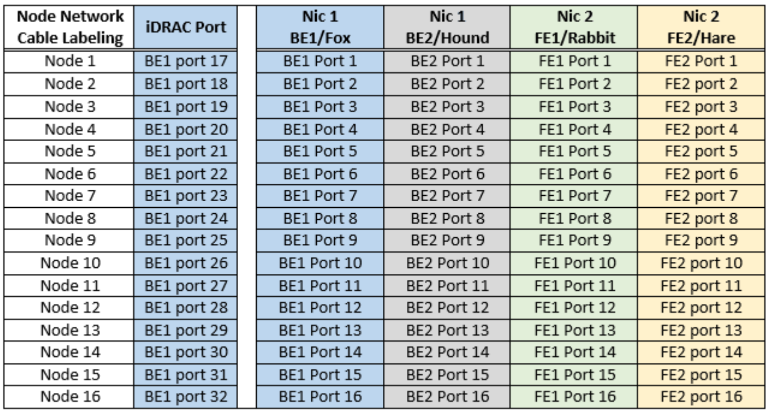
- EX5000S only uses nodes 1-7 in the outlined table.
- EX5000D only uses nodes 1-14 in the outlined table.



Node Network Port Cabling	iDRAC Port	Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	Server 1 iDRAC	Server 1 BE1	Server 1 BE2	Server 1 FE1	Server 1 FE2
Node 2	Server 2 iDRAC	Server 2 BE1	Server 2 BE2	Server 2 FE1	Server 2 FE2
Node 3	Server 3 iDRAC	Server 3 BE1	Server 3 BE2	Server 3 FE1	Server 3 FE2
Node 4	Server 4 iDRAC	Server 4 BE1	Server 4 BE2	Server 4 FE1	Server 4 FE2
Node 5	Server 5 iDRAC	Server 5 BE1	Server 5 BE2	Server 5 FE1	Server 5 FE2
Node 6	Server 6 iDRAC	Server 6 BE1	Server 6 BE2	Server 6 FE1	Server 6 FE2
Node 7	Server 7 iDRAC	Server 7 BE1	Server 7 BE2	Server 7 FE1	Server 7 FE2
Node 8	Server 8 iDRAC	Server 8 BE1	Server 8 BE2	Server 8 FE1	Server 8 FE2
Node 9	Server 9 iDRAC	Server 9 BE1	Server 9 BE2	Server 9 FE1	Server 9 FE2
Node 10	Server 10 iDRAC	Server 10 BE1	Server 10 BE2	Server 10 FE1	Server 10 FE2
Node 11	Server 11 iDRAC	Server 11 BE1	Server 11 BE2	Server 11 FE1	Server 11 FE2
Node 12	Server 12 iDRAC	Server 12 BE1	Server 12 BE2	Server 12 FE1	Server 12 FE2
Node 13	Server 13 iDRAC	Server 13 BE1	Server 13 BE2	Server 13 FE1	Server 13 FE2
Node 14	Server 14 iDRAC	Server 14 BE1	Server 14 BE2	Server 14 FE1	Server 14 FE2
Node 15	Server 15 iDRAC	Server 15 BE1	Server 15 BE2	Server 15 FE1	Server 15 FE2
Node 16	Server 16 iDRAC	Server 16 BE1	Server 16 BE2	Server 16 FE1	Server 16 FE2

Figure 42. EX5000 node network port cabling connections

The EX5000 node network cable labeling is listed in the following table.



Node Network Cable Labeling	iDRAC Port	Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	BE1 port 17	BE1 Port 1	BE2 Port 1	FE1 Port 1	FE2 Port 1
Node 2	BE1 port 18	BE1 Port 2	BE2 Port 2	FE1 Port 2	FE2 port 2
Node 3	BE1 port 19	BE1 Port 3	BE2 Port 3	FE1 Port 3	FE2 port 3
Node 4	BE1 port 20	BE1 Port 4	BE2 Port 4	FE1 Port 4	FE2 port 4
Node 5	BE1 port 21	BE1 Port 5	BE2 Port 5	FE1 Port 5	FE2 port 5
Node 6	BE1 port 22	BE1 Port 6	BE2 Port 6	FE1 Port 6	FE2 port 6
Node 7	BE1 port 23	BE1 Port 7	BE2 Port 7	FE1 Port 7	FE2 port 7
Node 8	BE1 port 24	BE1 Port 8	BE2 Port 8	FE1 Port 8	FE2 port 8
Node 9	BE1 port 25	BE1 Port 9	BE2 Port 9	FE1 Port 9	FE2 port 9
Node 10	BE1 port 26	BE1 Port 10	BE2 Port 10	FE1 Port 10	FE2 port 10
Node 11	BE1 port 27	BE1 Port 11	BE2 Port 11	FE1 Port 11	FE2 port 11
Node 12	BE1 port 28	BE1 Port 12	BE2 Port 12	FE1 Port 12	FE2 port 12
Node 13	BE1 port 29	BE1 Port 13	BE2 Port 13	FE1 Port 13	FE2 port 13
Node 14	BE1 port 30	BE1 Port 14	BE2 Port 14	FE1 Port 14	FE2 port 14
Node 15	BE1 port 31	BE1 Port 15	BE2 Port 15	FE1 Port 15	FE2 port 15
Node 16	BE1 port 32	BE1 Port 16	BE2 Port 16	FE1 Port 16	FE2 port 16

Figure 43. EX5000 node network cable labeling

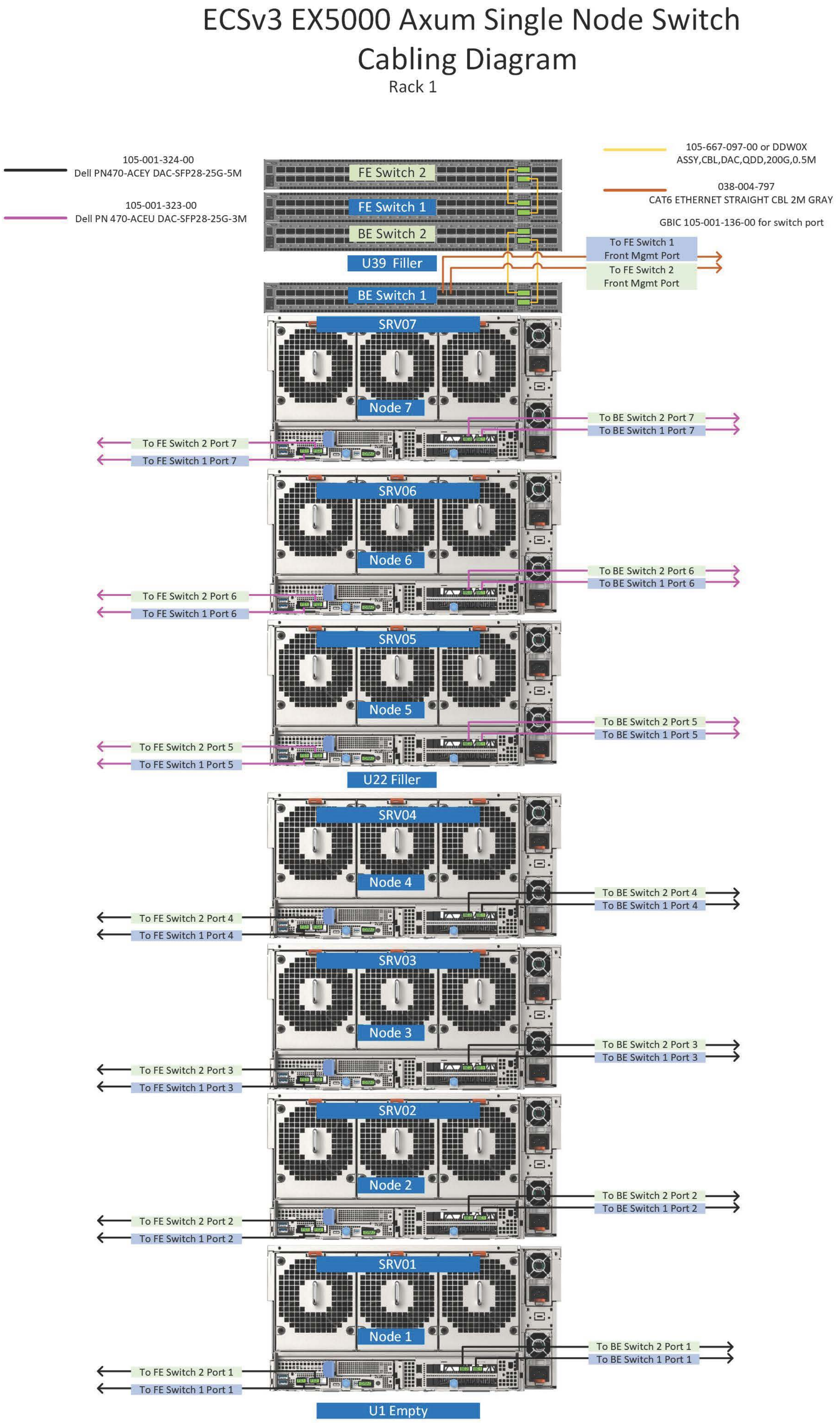

ECSv3 EX5000 Axum Single Node Switch
Cabling Diagram
Rack 1
105-001-324-00
Dell PN470-ACEY DAC-SFP28-25G-5M
105-001-323-00
Dell PN 470-ACEU DAC-SFP28-25G-3M
105-667-097-00 or DDW0X
ASSY,CBL,DAC,QDD,200G,0.5M
038-004-797
CAT6 ETHERNET STRAIGHT CBL 2M GRAY
GBIC 105-001-136-00 for switch port
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
BE Switch 1
To FE Switch 1
Front Mgmt Port
To FE Switch 2
Front Mgmt Port
SRV07
Node 7
To BE Switch 2 Port 7
To BE Switch 1 Port 7
To FE Switch 2 Port 7
To FE Switch 1 Port 7
SRV06
Node 6
To BE Switch 2 Port 6
To BE Switch 1 Port 6
To FE Switch 2 Port 6
To FE Switch 1 Port 6
SRV05
Node 5
To BE Switch 2 Port 5
To BE Switch 1 Port 5
To FE Switch 2 Port 5
To FE Switch 1 Port 5
U22 Filler
SRV04
Node 4
To BE Switch 2 Port 4
To BE Switch 1 Port 4
To FE Switch 2 Port 4
To FE Switch 1 Port 4
SRV03
Node 3
To BE Switch 2 Port 3
To BE Switch 1 Port 3
To FE Switch 2 Port 3
To FE Switch 1 Port 3
SRV02
Node 2
To BE Switch 2 Port 2
To BE Switch 1 Port 2
To FE Switch 2 Port 2
To FE Switch 1 Port 2
SRV01
Node 1
To BE Switch 2 Port 1
To BE Switch 1 Port 1
To FE Switch 2 Port 1
To FE Switch 1 Port 1
U1 Empty

Figure 44. ECS EX5000S Dell Provided Switch/Network cabling

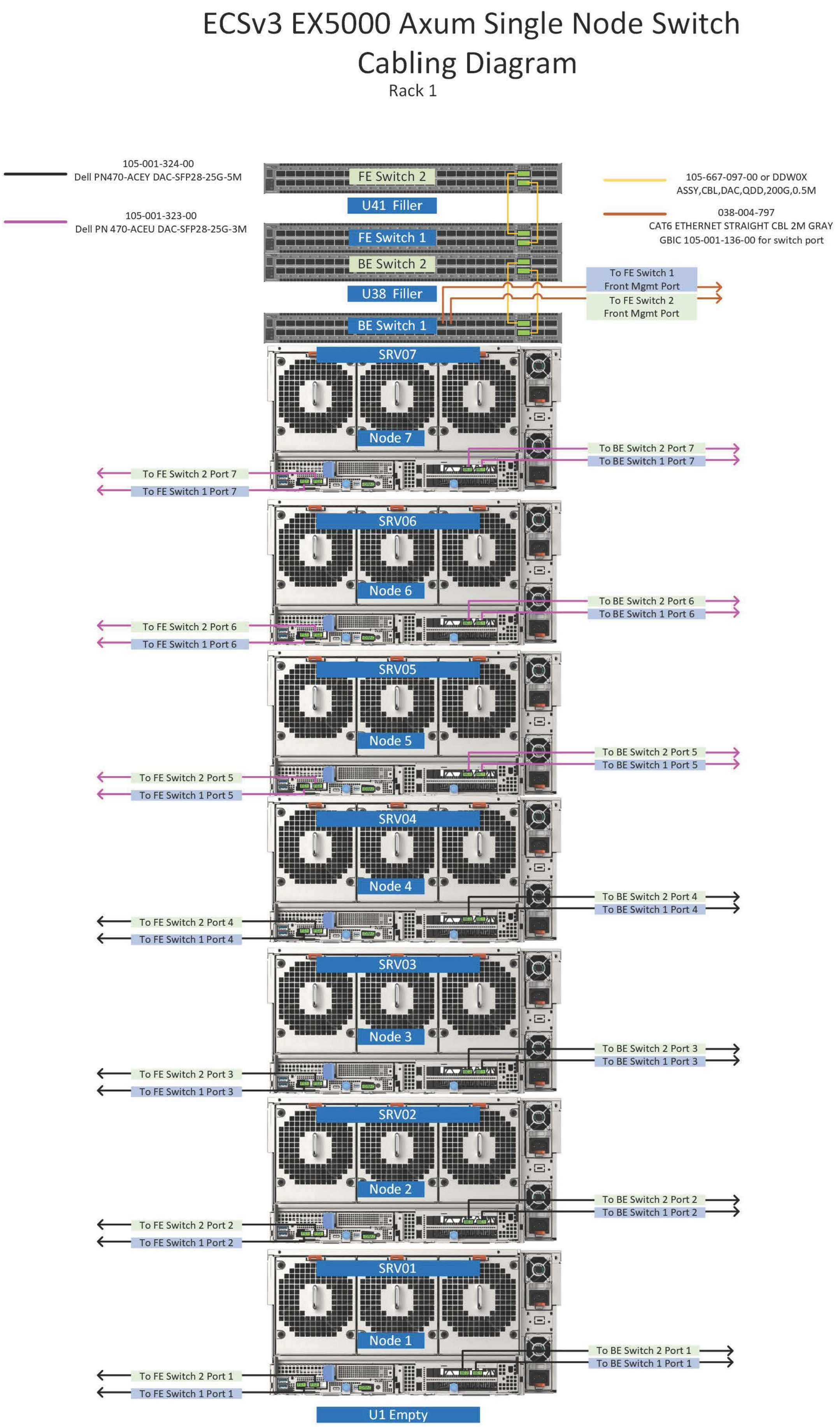

ECSv3 EX5000 Axum Single Node Switch Cabling Diagram
Rack 1
105-001-324-00
Dell PN470-ACEY DAC-SFP28-25G-5M
105-001-323-00
Dell PN 470-ACEU DAC-SFP28-25G-3M
105-667-097-00 or DDW0X
ASSY,CBL,DAC,QDD,200G,0.5M
038-004-797
CAT6 ETHERNET STRAIGHT CBL 2M GRAY
GBIC 105-001-136-00 for switch port
FE Switch 2
U41 Filler
FE Switch 1
BE Switch 2
U38 Filler
BE Switch 1
To FE Switch 1 Front Mgmt Port
To FE Switch 2 Front Mgmt Port
SRV07
Node 7
To BE Switch 2 Port 7
To BE Switch 1 Port 7
To FE Switch 2 Port 7
To FE Switch 1 Port 7
SRV06
Node 6
To BE Switch 2 Port 6
To BE Switch 1 Port 6
To FE Switch 2 Port 6
To FE Switch 1 Port 6
SRV05
Node 5
To BE Switch 2 Port 5
To BE Switch 1 Port 5
To FE Switch 2 Port 5
To FE Switch 1 Port 5
SRV04
Node 4
To BE Switch 2 Port 4
To BE Switch 1 Port 4
To FE Switch 2 Port 4
To FE Switch 1 Port 4
SRV03
Node 3
To BE Switch 2 Port 3
To BE Switch 1 Port 3
To FE Switch 2 Port 3
To FE Switch 1 Port 3
SRV02
Node 2
To BE Switch 2 Port 2
To BE Switch 1 Port 2
To FE Switch 2 Port 2
To FE Switch 1 Port 2
SRV01
Node 1
To BE Switch 2 Port 1
To BE Switch 1 Port 1
To FE Switch 2 Port 1
To FE Switch 1 Port 1
U1 Empty

Figure 45. ECS EX5000S Customer Provided Switch/Network cabling

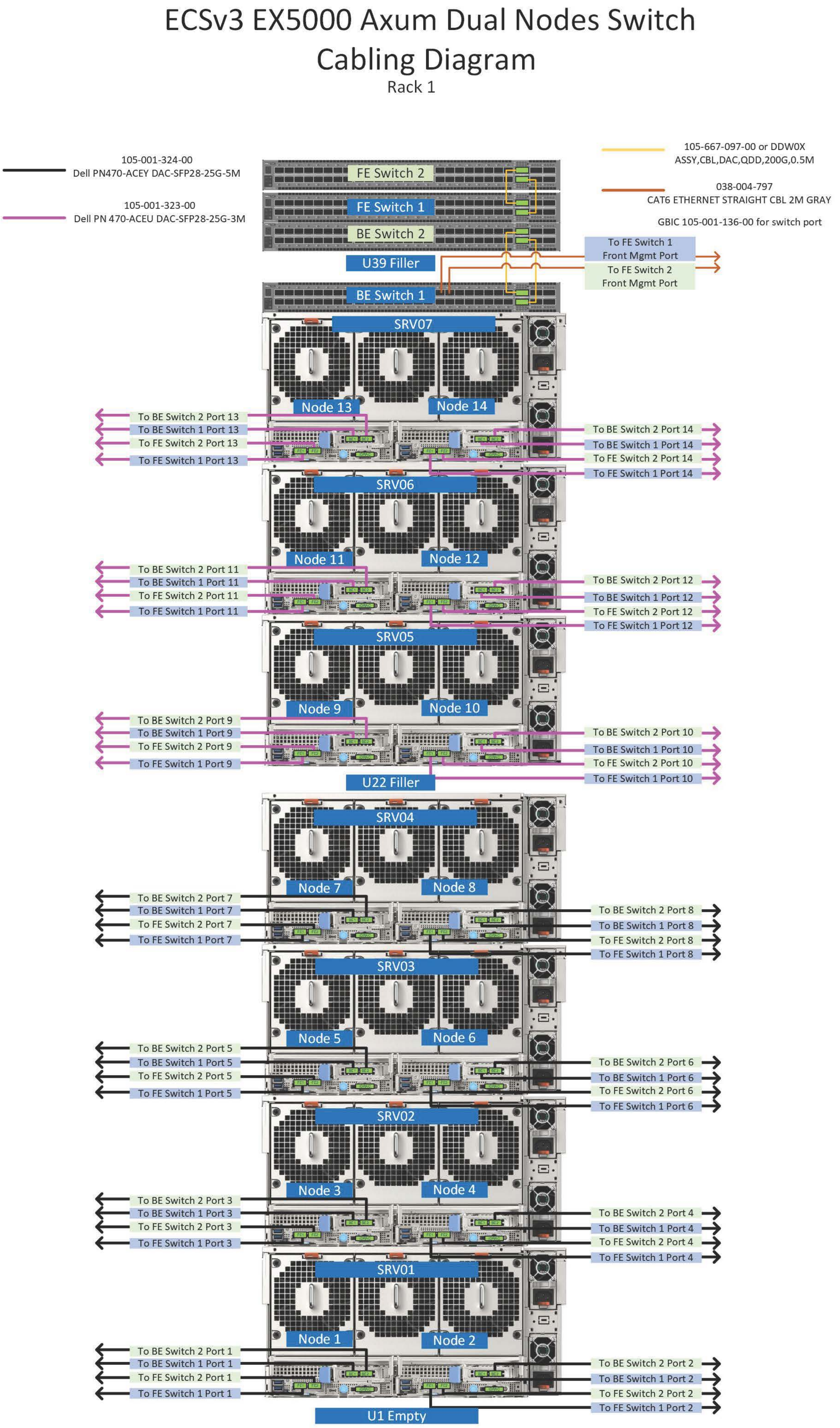

ECSv3 EX5000 Axum Dual Nodes Switch Cabling Diagram
Rack 1
105-001-324-00
Dell PN470-ACEY DAC-SFP28-25G-5M
105-001-323-00
Dell PN 470-ACEU DAC-SFP28-25G-3M
105-667-097-00 or DDW0X
ASSY,CBL,DAC,QDD,200G,0.5M
038-004-797
CAT6 ETHERNET STRAIGHT CBL 2M GRAY
GBIC 105-001-136-00 for switch port
FE Switch 2
FE Switch 1
BE Switch 2
U39 Filler
To FE Switch 1 Front Mgmt Port
To FE Switch 2 Front Mgmt Port
BE Switch 1
SRV07
Node 13
Node 14
To BE Switch 2 Port 13
To BE Switch 1 Port 13
To FE Switch 2 Port 13
To FE Switch 1 Port 13
To BE Switch 2 Port 14
To BE Switch 1 Port 14
To FE Switch 2 Port 14
To FE Switch 1 Port 14
SRV06
Node 11
Node 12
To BE Switch 2 Port 11
To BE Switch 1 Port 11
To FE Switch 2 Port 11
To FE Switch 1 Port 11
To BE Switch 2 Port 12
To BE Switch 1 Port 12
To FE Switch 2 Port 12
To FE Switch 1 Port 12
SRV05
Node 9
Node 10
To BE Switch 2 Port 9
To BE Switch 1 Port 9
To FE Switch 2 Port 9
To FE Switch 1 Port 9
To BE Switch 2 Port 10
To BE Switch 1 Port 10
To FE Switch 2 Port 10
To FE Switch 1 Port 10
U22 Filler
SRV04
Node 7
Node 8
To BE Switch 2 Port 7
To BE Switch 1 Port 7
To FE Switch 2 Port 7
To FE Switch 1 Port 7
To BE Switch 2 Port 8
To BE Switch 1 Port 8
To FE Switch 2 Port 8
To FE Switch 1 Port 8
SRV03
Node 5
Node 6
To BE Switch 2 Port 5
To BE Switch 1 Port 5
To FE Switch 2 Port 5
To FE Switch 1 Port 5
To BE Switch 2 Port 6
To BE Switch 1 Port 6
To FE Switch 2 Port 6
To FE Switch 1 Port 6
SRV02
Node 3
Node 4
To BE Switch 2 Port 3
To BE Switch 1 Port 3
To FE Switch 2 Port 3
To FE Switch 1 Port 3
To BE Switch 2 Port 4
To BE Switch 1 Port 4
To FE Switch 2 Port 4
To FE Switch 1 Port 4
SRV01
Node 1
Node 2
To BE Switch 2 Port 1
To BE Switch 1 Port 1
To FE Switch 2 Port 1
To FE Switch 1 Port 1
To BE Switch 2 Port 2
To BE Switch 1 Port 2
To FE Switch 2 Port 2
To FE Switch 1 Port 2
U1 Empty

Figure 46. ECS EX5000D Dell Provided Switch/Network cabling

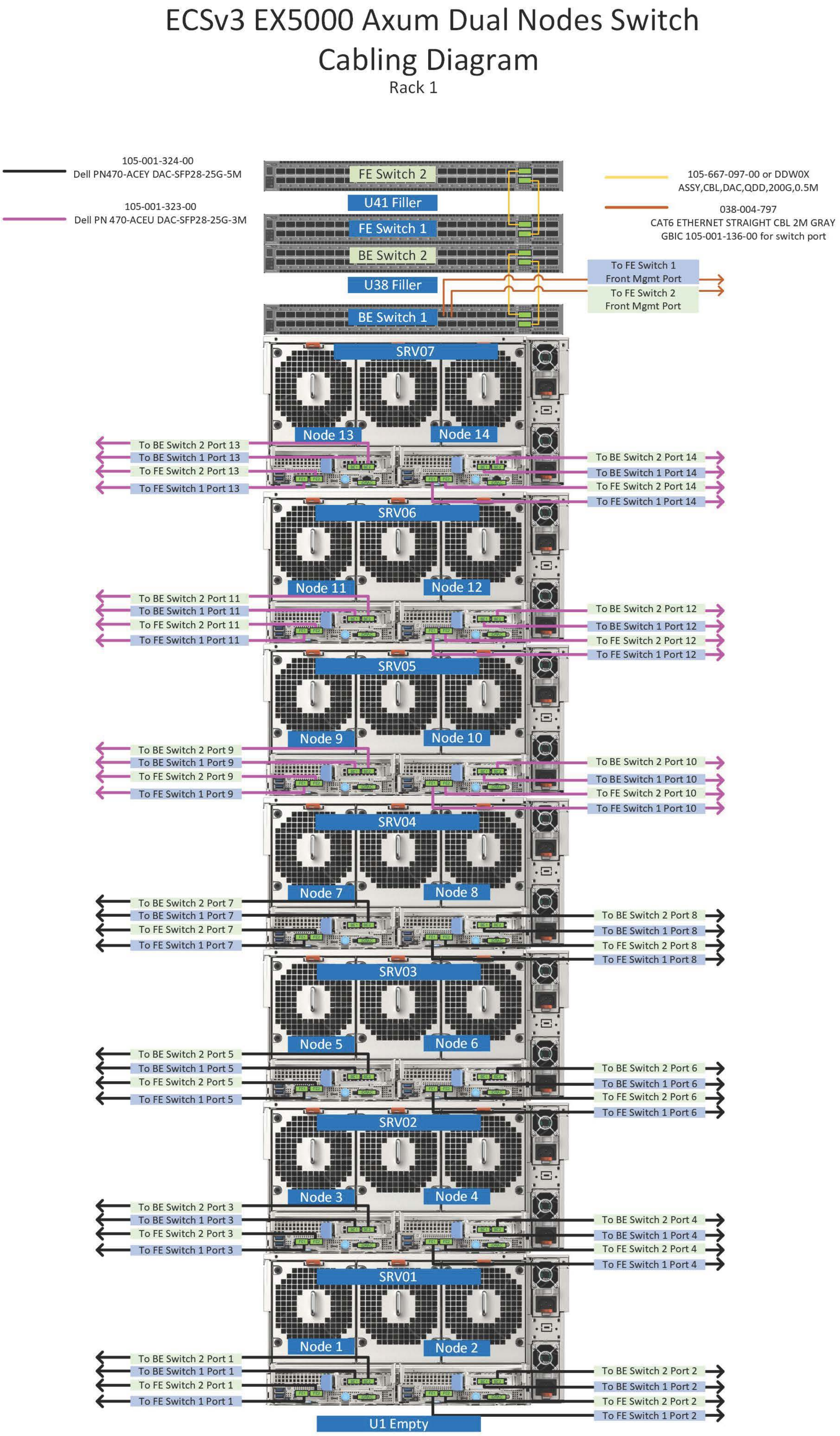

ECSv3 EX5000 Axum Dual Nodes Switch Cabling Diagram
Rack 1
105-001-324-00
Dell PN470-ACEY DAC-SFP28-25G-5M
105-001-323-00
Dell PN 470-ACEU DAC-SFP28-25G-3M
105-667-097-00 or DDW0X
ASSY,CBL,DAC,QDD,200G,0.5M
038-004-797
CAT6 ETHERNET STRAIGHT CBL 2M GRAY
GBIC 105-001-136-00 for switch port
FE Switch 2
U41 Filler
FE Switch 1
BE Switch 2
U38 Filler
BE Switch 1
To FE Switch 1 Front Mgmt Port
To FE Switch 2 Front Mgmt Port
SRV07
Node 13
Node 14
To BE Switch 2 Port 13
To BE Switch 1 Port 13
To FE Switch 2 Port 13
To FE Switch 1 Port 13
To BE Switch 2 Port 14
To BE Switch 1 Port 14
To FE Switch 2 Port 14
To FE Switch 1 Port 14
SRV06
Node 11
Node 12
To BE Switch 2 Port 11
To BE Switch 1 Port 11
To FE Switch 2 Port 11
To FE Switch 1 Port 11
To BE Switch 2 Port 12
To BE Switch 1 Port 12
To FE Switch 2 Port 12
To FE Switch 1 Port 12
SRV05
Node 9
Node 10
To BE Switch 2 Port 9
To BE Switch 1 Port 9
To FE Switch 2 Port 9
To FE Switch 1 Port 9
To BE Switch 2 Port 10
To BE Switch 1 Port 10
To FE Switch 2 Port 10
To FE Switch 1 Port 10
SRV04
Node 7
Node 8
To BE Switch 2 Port 7
To BE Switch 1 Port 7
To FE Switch 2 Port 7
To FE Switch 1 Port 7
To BE Switch 2 Port 8
To BE Switch 1 Port 8
To FE Switch 2 Port 8
To FE Switch 1 Port 8
SRV03
Node 5
Node 6
To BE Switch 2 Port 5
To BE Switch 1 Port 5
To FE Switch 2 Port 5
To FE Switch 1 Port 5
To BE Switch 2 Port 6
To BE Switch 1 Port 6
To FE Switch 2 Port 6
To FE Switch 1 Port 6
SRV02
Node 3
Node 4
To BE Switch 2 Port 3
To BE Switch 1 Port 3
To FE Switch 2 Port 3
To FE Switch 1 Port 3
To BE Switch 2 Port 4
To BE Switch 1 Port 4
To FE Switch 2 Port 4
To FE Switch 1 Port 4
SRV01
Node 1
Node 2
To BE Switch 2 Port 1
To BE Switch 1 Port 1
To FE Switch 2 Port 1
To FE Switch 1 Port 1
To BE Switch 2 Port 2
To BE Switch 1 Port 2
To FE Switch 2 Port 2
To FE Switch 1 Port 2
U1 Empty

Figure 47. ECS EX5000D Customer Provided Switch/Network cabling

EX5000 Cable Kits

Learn about the cable kits required for the EX5000 system.

Table 16. Back-end cable kits

Kit contents	Number of kits required per EX5000 Node	Kit type	Models
• 2 x 25G Twin-ax cable • 1x 1 GbE CAT6 cable • 1x RJ45 SFP+ module for fox switch • Labels	One	Back-End Cabling Kits	ES6-25-3M-BE-KTS ES6-25-5M-BE-KTS

ⓘ **NOTE:** If an EX5000S or EX5000D is more than a chassis length from the switches, the 5M length kits are recommended because up to 1.5M of cable length is used in the cable management arm.

Table 17. Front-end cable kits

Kit contents	Number of kits required per EX5000 Node	Kit type	Models
• 2 x 25G Twin-ax cable • Labels	One, if the customer is using Dell-provided switches.	Front-End Cabling Kits	ES6-25-3M-FE-KTS ES6-25-5M-FE-KTS

ⓘ **NOTE:** Front-end cable kits not required when customer provides front-end switches.25 GbE Optics are available for the servers when customer- provided switches are installed.

ⓘ **NOTE:** If an EX5000S or EX5000D is more than a chassis length from the switches, the 5M length kits are recommended because up to 1.5M of cable length is used in the cable management arm.

Customer Connection Kits

EX5000 requires Customer Connection Kits to connect the Dell Technologies provided Front-End switches uplinks to the customer's network.

Use 25 Gb optics (SR) SFPs in the EX5000 server front-end NIC adapter to connect to customer-provided switches. The following table provides the speed and the model details.

Table 18. Speed and model details

Speed	Model
1 Gb	ES6-1GBASET-XVR
10 Gb	ES6-10GB-SR
	ES6-10GB-LR
	ES6-10GB-ER
25 Gb	ES6-25GB-SR
	ES6-25GB-LR
40 Gb	ES6-40GB-SR4
	ES6-40GB-LR4
100 Gb	ES6-100GB-SR4
	ES6-100GB-LR4
	ES6-100GB-CWDM4
	ES6-100GB-PSM4

Table 18. Speed and model details (continued)

Speed	Model
	ES6-100GB-QSA

4

EXF900 Platform

Topics:

- EXF900 hardware components
- EXF900 configurations
- EXF900 server
- EXF900 Upgrade Paths
- EXF900 disk drives
- EXF900 power cabling
- EXF900 iDRAC cabling
- EXF900 network cabling
- EXF900 Cable Kits
- Aggregated EXF900 back-end network between multiple racks

EXF900 hardware components

The EXF900 ECS appliance includes the following hardware components.

Table 19. EXF900 hardware components

Component	Description
40U rack (Optional)	Titan D racks that include: ● Gen3 0U PDUs supporting single phase, three-phase delta, and three-phase WYE ● Front and rear doors ● Racking by Dell Technologies manufacturing (On-site only) In addition to the Dell Technologies rack, the EXF900 nodes can be installed in customer-provided racks. For more information about third-party racking requirements, see the *ECS EXF900 Third-Party Rack Installation Guide*.
Backend (BE) switches for private network connection	● Two Dell Technologies S5248F 25 GbE 1U Ethernet switches with 48 x 25 GbE SFP ports and 4 x 100 GbE uplink ports. ● 2 x 200 GbE VLT cables per HA pair.
Front-end (FE) switches for customer public network connection (Optional)	● Two optional Dell Technologies S5248F 25 GbE 1U Ethernet switches can be obtained for network connection. The customer can also provide their own 25 GbE HA pair for the front end. ● If the customer provides their own front-end switches, they must supply all VLT cables, SFPs, or external connection cables. ● If Dell Technologies S5248F 25 GbE front-end switches are used, then 2 x 200 GbE VLT cables are provided.
Nodes	● Minimum number of nodes per rack is 5 with increments of one node up to a maximum of 16 nodes. ● NVMe SSD drive sizes are 3.84 TB at the launch. ⓘ **NOTE:** EXF900 supports 7.68 TB and 15.36 TB drives with ECS 3.6.1 and above. ● There are no systems that ship fully racked. The customer can buy a rack, the PDUs, and the service tray, all separately. ● 12 or 24 NVMe SSD drives in each node. ● 480 GB m.2 (BOSS) system disk in each node. ● 192 GB RAM per node using 12x16GB Dual Rank RDIMMs. ● Dual Intel Xeon 24-core 165 W CPUs. ● Dual 1100 W Platinum power supply (hot swappable) and 1600 W on 15.36 TB model.

Table 19. EXF900 hardware components (continued)

Component	Description
	- Each node has 4 x 25 GbE networking.

EXF900 configurations

This section describes the EXF900 ECS appliance configurations.

The following diagram shows the front view of an EXF900 rack with the minimum node configuration and an EXF900 rack with the maximum node configuration. The rear view requires a brace wherever there is empty space above or below an EXF900 server.

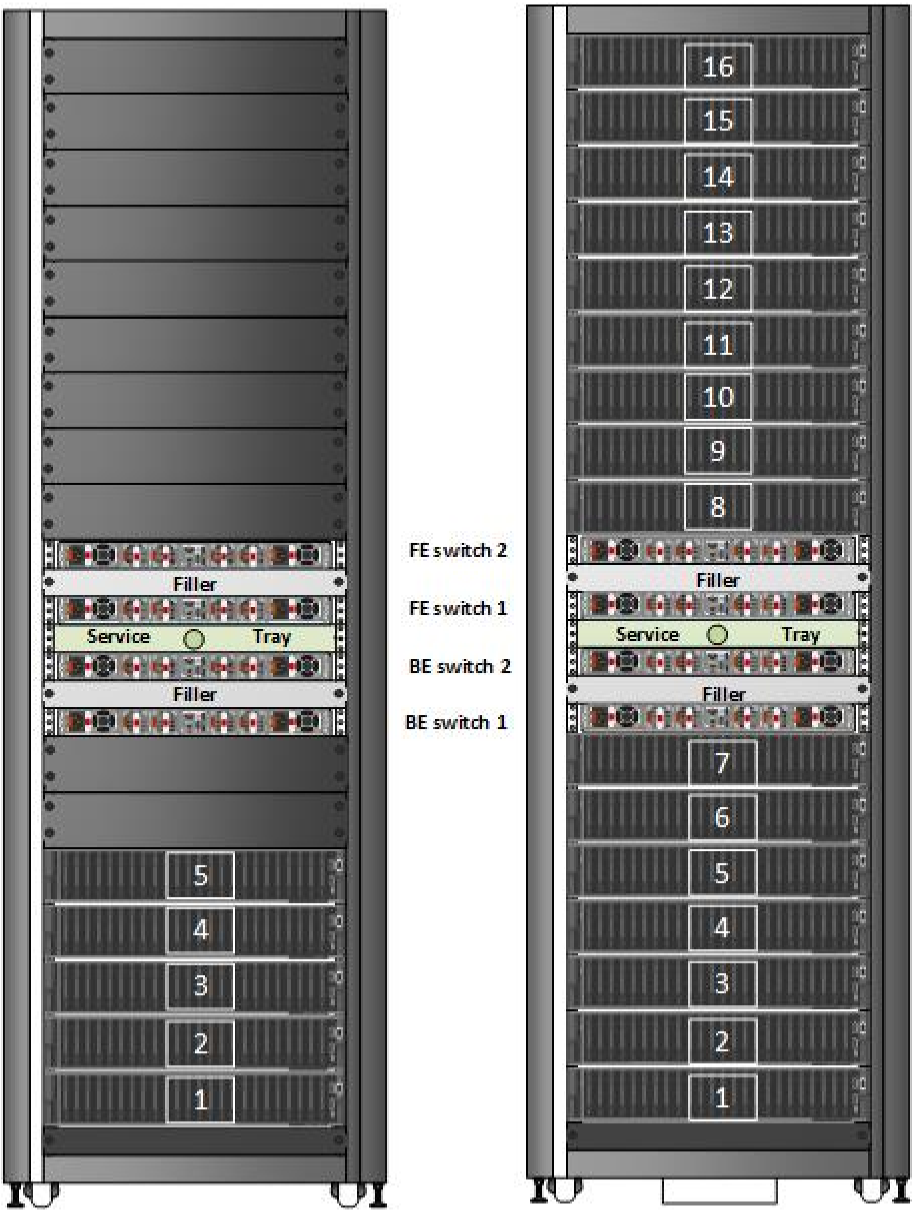

Filler
Service
Tray
Filler
5
4
3
2
1
FE switch 2
FE switch 1
BE switch 2
BE switch 1
16
15
14
13
12
11
10
9
8
Filler
Service
Tray
Filler
7
6
5
4
3
2
1

Figure 48. EXF900 minimum (left) and maximum (right) configurations

The EXF900 appliance is available in the following configurations within a Dell Technologies rack or a customer-provided rack.

Table 20. EXF900 configurations

Nodes	Disks in each node	Disk size	RAW storage capacity
5 (minimum configuration)	12	3.84 TB	230 TB
	24	3.84 TB	460 TB
	12	7.68 TB	460 TB
	24	7.68 TB	921 TB
	12	15.36 TB	921 TB
	24	15.36 TB	1843 TB
6	12	3.84 TB	276 TB
	24	3.84 TB	552 TB
	12	7.68 TB	552 TB
	24	7.68 TB	1105 TB
	12	15.36 TB	1105 TB
	24	15.36 TB	2211 TB
7	12	3.84 TB	322 TB
	24	3.84 TB	645 TB
	12	7.68 TB	645 TB
	24	7.68 TB	1290 TB
	12	15.36 TB	1290 TB
	24	15.36 TB	2580 TB
8	12	3.84 TB	368 TB
	24	3.84 TB	737 TB
	12	7.68 TB	737 TB
	24	7.68 TB	1474 TB
	12	15.36 TB	1474 TB
	24	15.36 TB	2949 TB
9	12	3.84 TB	414 TB
	24	3.84 TB	829 TB
	12	7.68 TB	829 TB
	24	7.68 TB	1658 TB
	12	15.36 TB	1658 TB
	24	15.36 TB	3317 TB
10	12	3.84 TB	460 TB
	24	3.84 TB	921 TB
	12	7.68 TB	921 TB
	24	7.68 TB	1843 TB
	12	15.36 TB	1843 TB
	24	15.36 TB	3686 TB
11	12	3.84 TB	506 TB

Table 20. EXF900 configurations (continued)

Nodes	Disks in each node	Disk size	RAW storage capacity
	24	3.84 TB	1013 TB
	12	7.68 TB	1013 TB
	24	7.68 TB	2027 TB
	12	15.36 TB	2027 TB
	24	15.36 TB	4055 TB
12	12	3.84 TB	552 TB
	24	3.84 TB	1105 TB
	12	7.68 TB	1105 TB
	24	7.68 TB	2211 TB
	12	15.36 TB	2211 TB
	24	15.36 TB	4423 TB
13	12	3.84 TB	599 TB
	24	3.84 TB	1198 TB
	12	7.68 TB	1198 TB
	24	7.68 TB	2396 TB
	12	15.36 TB	2396 TB
	24	15.36 TB	4792 TB
14	12	3.84 TB	645 TB
	24	3.84 TB	1290 TB
	12	7.68 TB	1290 TB
	24	7.68 TB	2580 TB
	12	15.36 TB	2580 TB
	24	15.36 TB	5160 TB
15	12	3.84 TB	601 TB
	24	3.84 TB	1382 TB
	12	7.68 TB	1382 TB
	24	7.68 TB	2764 TB
	12	15.36 TB	2764 TB
	24	15.36 TB	5529 TB
16 (maximum configuration)	12	3.84 TB	737 TB
	24	3.84 TB	1474 TB
	12	7.68 TB	1474 TB
	24	7.68 TB	2949 TB
	12	15.36 TB	2949 TB
	24	15.36 TB	5898 TB

EXF900 server

EXF900 servers have the following standard features:

Table 21. Standard features of EXF900 servers

Features	All flash node w/ 3.84 TB, 7.68 TB, and 15.36 TB capacities.
NVMe in front slots	3.84 TB, 7.68 TB, and 15.36 TB NVMe SSD
Chassis	● EXF900 24 x 2.5" two CPU chassis ● One-node server (2U) with two CPUs per node ● Maximum chassis weight is 23.8 kg (52.5 lbs)
Riser Configuration	● Each EXF900 server supports up to seven PCI express (PCIe) Gen3 expansion cards that can be installed on the system board using three expansion card risers. ● Config 9 (1A+2D+3A)
Processors	2 x Intel Xeon 24 core, 165 W
Memory	12 x16GB RDIMM Dual Rank
NDC	Mellanox ConnectX-4 (2x25GbE)
PCIe Slot 3	PCIe Extender Card1 for NVMe drives
PCIe Slot 4	PCIe Extender Card2 for NVMe drives
PCIe Slot 5	BOSS controller card + with 1 M.2 stick 480 GB, FH
PCIe Slot 7	Broadcom 57414 (2x25GbE)
Management	iDRAC9 Enterprise
Power	● 2 x 1100 W Platinum ● 2 x 1600 W in 15.36 TB model

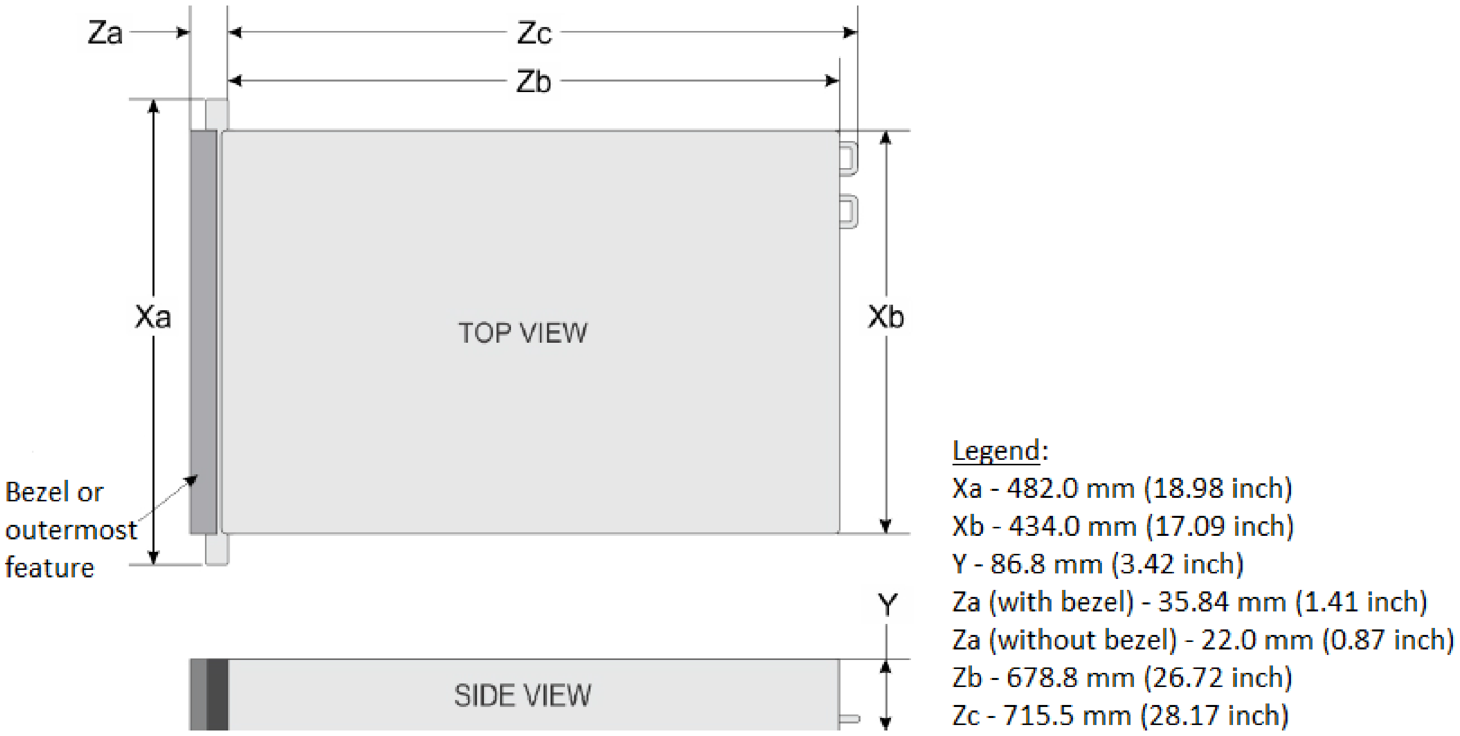

Za
Zc
Zb
Xa
TOP VIEW
Xb
Bezel or outermost feature
Y
SIDE VIEW
Legend:
Xa - 482.0 mm (18.98 inch)
Xb - 434.0 mm (17.09 inch)
Y - 86.8 mm (3.42 inch)
Za (with bezel) - 35.84 mm (1.41 inch)
Za (without bezel) - 22.0 mm (0.87 inch)
Zb - 678.8 mm (26.72 inch)
Zc - 715.5 mm (28.17 inch)

Figure 49. EXF900 server physical dimensions

Server front view

This section helps you understand the front view of the server.

The following figure shows the EXF900 2U server chassis front with (12 / 24) x 2.5" NVMe SSDs.

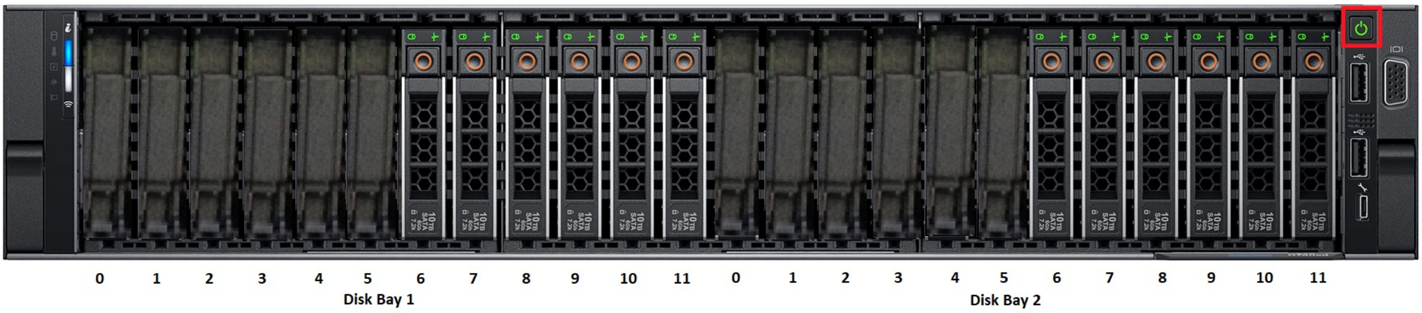


Figure 50. EXF900 server chassis front view with 12 disks

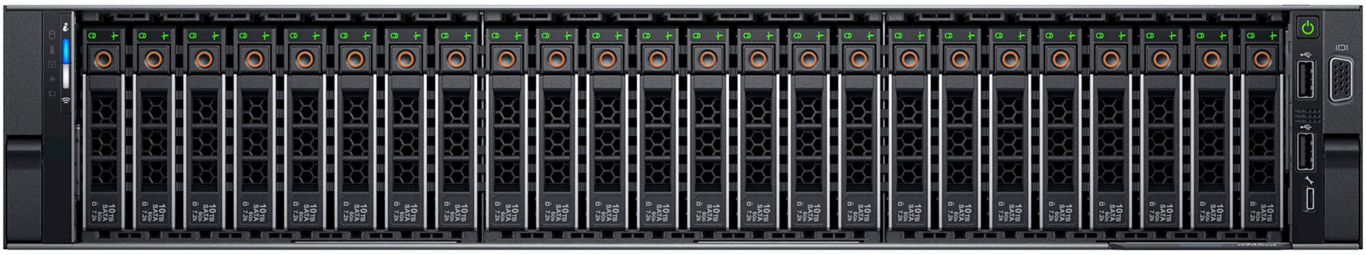


Figure 51. EXF900 server chassis front view with 24 disks

LED indicators are on the left and right side of the server front panels.

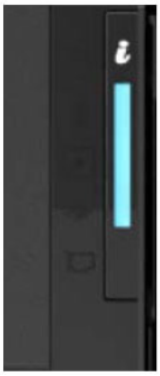


Figure 52. Left control panel

The left control panel LED behavior is broken into two subsets, the light bar and the status LEDs. The light bar also functions as a button. The light bar indicates chassis health and also functions as System ID when pressed.

Table 22. Decoding of LEDs in light bar

Status	ID button
Healthy	Solid Blue

Table 22. Decoding of LEDs in light bar (continued)

Status	ID button
Fault	Blink Amber
System ID	Blink Blue

There are five status LEDs to indicate and identify any failed hardware components.

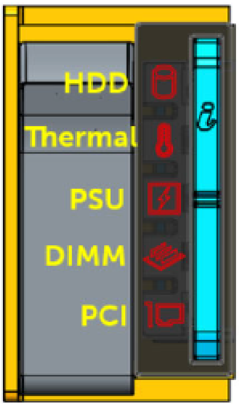


Figure 53. Status LEDs decoded view

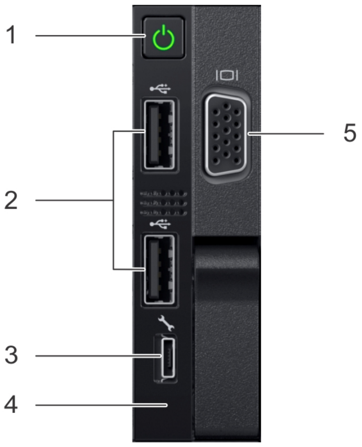


Figure 54. Right control panel

1. Power button with integrated power LED
2. Two USB 3.0 ports
3. Micro-USB for iDRAC Direct
4. Status LED for iDRAC Direct
5. VGA port

Server rear view

This section describes the rear view of the server.

The EXF900 server chassis provides dual hot-swappable power supplies with 1 + 1 redundancy, autosensing and autoswitching capability.

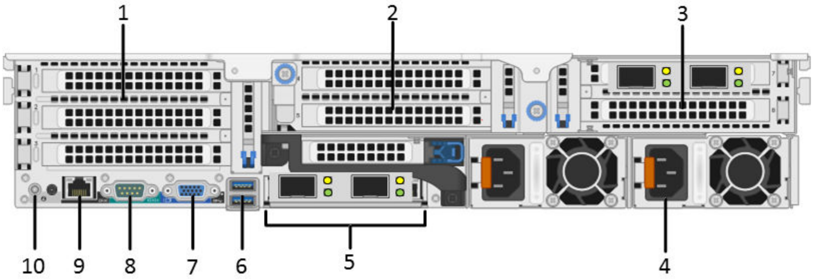


Figure 55. EXF900 server chassis rear view

Table 23. Server Panel, Ports, and Slots

Item	Panel, Ports, and Slots	Description
1	Full-height PCIe expansion card slot (2)	The PCIe expansion card slot (riser 1) connects up to two full-height PCIe expansion cards to the system. The PCIe x16 extender card is used to connect to the NVMe expander from CPU to Bay 2 drives (slot 3).
2	Mixed sized PCIe expansion card slot	The PCIe expansion card slot (riser 2) connects two full-height and one half-height PCIe expansion cards to the system. The Boot Optimized Storage Subsystem (BOSS) controller card with one M.2 stick is in the top PCIe slot (slot 5). The PCIe x16 extender card is used to connect to the NVMe expander from CPU to Bay 1 drives (slot 4).
3	Full-height PCIe expansion card slot (2)	The PCIe expansion card slot (riser 3) connects two full-height PCIe expansion cards to the system. The NIC card two 25 GbE data ports connect of each node connect to one of the data ports on the front-end switches (slot 7).
4	Power supply unit (2)	Two AC or DC power supply units (PSUs)
5	NIC ports	The NIC ports that are integrated on the network daughter card (NDC) provide network connectivity. The two 25 GbE data ports of each node connect to the data ports on the back-end switches.
6	USB port (2)	The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.
7	VGA port	This enables you to connect a display device to the system.
8	Serial port	This enables you to connect a serial device to the system.
9	iDRAC9 dedicated port	This enables you to remotely access iDRAC. For more information, see the Integrated Dell Remote Access Controller 9 (iDRAC9) User's Guide.
10	System identification button	The System Identification (ID) button is available on the front and back of the systems. Press the button to identify a system in a rack by turning on the system ID button. You can also use the system ID button to reset iDRAC and to access BIOS using the step through mode.

EXF900 Upgrade Paths

Describes the EXF900 ECS appliance upgrade paths.

If there are five or more nodes in the system (VDC) with the same disk size and total node disk capacity, then the minimum node expansion is only one. This upgrade is possible when the expansion node has the same disk size and the total disk capacity of the existing nodes.

For example, you have an EXF900 appliance with five nodes containing 24 x 3.84 TB disks (92 TB). You can add a single node with 24 x 3.84 TB disks.

If you are adding nodes that have different disk sizes or node capacity than the nodes currently in the system, then you must add a minimum of five nodes at a time.

For example, you have an EXF900 appliance with five nodes containing 24 x 3.84 TB drives. If you want to add nodes of different drive size (12 x 3.84 TB), you must add five or more nodes, at a time.

NOTE: All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes within a rack.
- Disk upgrade kits are available in 12-disk increments.
- EXF900 upgrades from 12 to 24 disks.
- To add the disk capacity to an EXF900 appliance, disk upgrade kits per node must be ordered based on the existing disk capacity.
- All empty drive slots must be filled with a disk filler.

EXF900 disk drives

This section describes the disk drives that are integrated into the server chassis of the EXF900 appliance.

EXF900 nodes contain 24 x 2.5-inch NVMe front-accessible drives in bay 1 (slot 0 to 11) and bay 2 (slot 0 to 11). Disk sizes are 3.84 TB or (7.68 TB or 15.36 TB model supported with ECS 3.6.1 and later). All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes within a rack. In PCIe slot 5 of each node, there is a 480 GB Boot Optimized Storage Subsystem (BOSS) controller card with one M.2 stick.

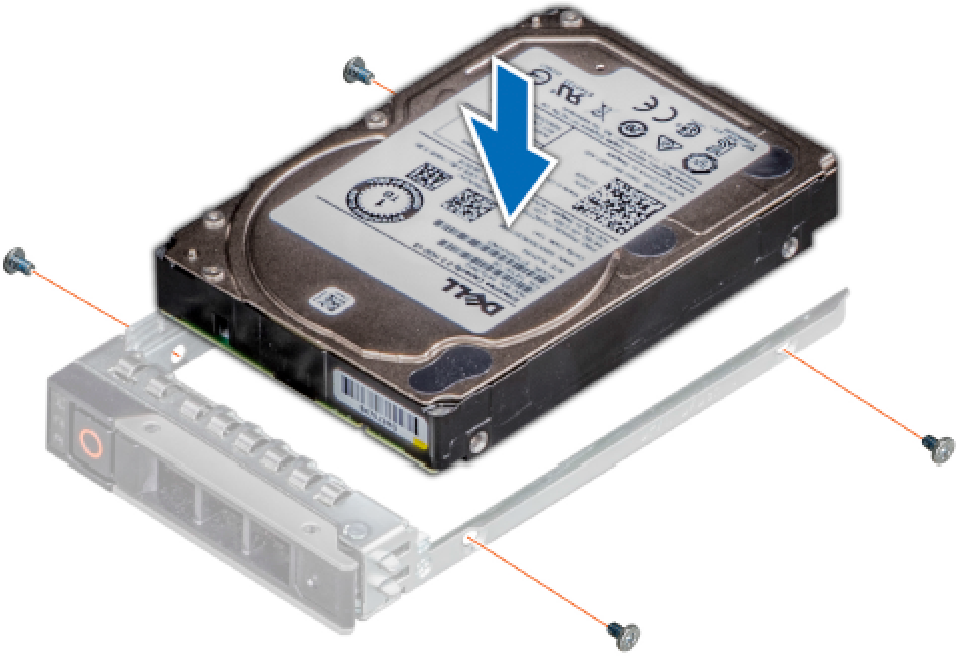


Figure 56. EXF900 disk drive in carrier

EXF900 power cabling

This section provides EXF900 ECS appliance cabling diagrams for single-phase AC power and three-phase delta and WYE AC power.

Use the power and weight calculator to refine the power and heat values to more-closely match the hardware configuration for your system. The calculator contains the latest information for power and weight planning.

The EXF900 appliance connections to 0U PDU and 2U PDU outlets are cabled in the following configurations:

- EXF900 0U Single-Phase PDU
  - Standard
  - With aggregation switch–Rack 2 only
- EXF900 0U Three-Phase PDU
  - Standard
  - With aggregation switch–Rack 2 only

- EXF900 2U Single-Phase PDU
  - Standard
  - With aggregation switch
- EXF900 2U Three-Phase PDU
  - Standard
  - With aggregation switch

Table 24. EXF900 Standard Single-Phase 0U PDU Cabling

PDU Outlet	Component	Line cord per zone
37	Empty	4
36	Empty	4
35	Node 16	4
34	Node 15	4
33	Empty	4
32	Node 14	4
31	Node 13	4
30	Empty	3
29	Node 12	3
28	Node 11	3
27	Empty	3
26	Node 10	3
25	Node 9	3
24	Empty	2
23	Empty	2
22	Empty	2
21	Empty	2
20	Node 8	2
19	Node 7	2
18	Empty	2
17	Node 6	2
16	Node 5	2
15	Empty	2
14	FE SW2	2
13	FE SW1	2
12	Zone B Service Tray/Zone A Light Bar	1
11	BE SW 2	1
10	BE SW 1	1
9	Empty	1
8	Empty	1
7	Empty	1
6	Empty	1
5	Node 4	1

Table 24. EXF900 Standard Single-Phase 0U PDU Cabling (continued)

PDU Outlet	Component	Line cord per zone
4	Node 3	1
3	Empty	1
2	Node 2	1
1	Node 1	1

In the following diagrams, the switches plug into the front of the rack and route through the rails to the rear.

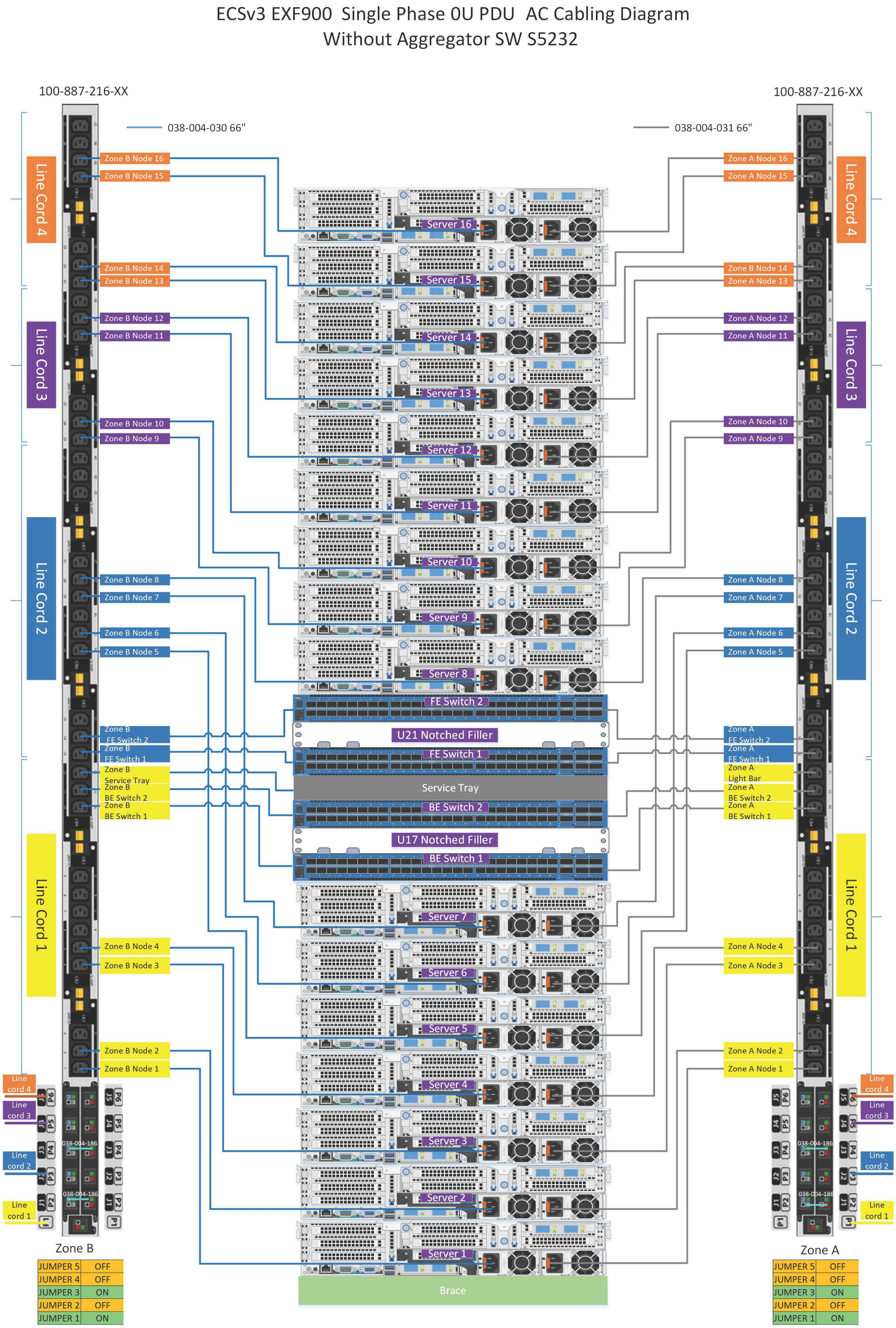

ECSv3 EXF900 Single Phase 0U PDU AC Cabling Diagram
Without Aggregator SW S5232
100-887-216-XX
100-887-216-XX
038-004-030 66"
038-004-031 66"
Line Cord 4
Line Cord 3
Line Cord 2
Line Cord 1
Zone B Node 16
Zone B Node 15
Zone B Node 14
Zone B Node 13
Zone B Node 12
Zone B Node 11
Zone B Node 10
Zone B Node 9
Zone B Node 8
Zone B Node 7
Zone B Node 6
Zone B Node 5
Zone B FE Switch 2
Zone B FE Switch 1
Zone B Service Tray
Zone B BE Switch 2
Zone B BE Switch 1
Zone B Node 4
Zone B Node 3
Zone B Node 2
Zone B Node 1
Zone A Node 16
Zone A Node 15
Zone B Node 14
Zone A Node 13
Zone A Node 12
Zone A Node 11
Zone A Node 10
Zone A Node 9
Zone A Node 8
Zone A Node 7
Zone A Node 6
Zone A Node 5
Zone A FE Switch 2
Zone A FE Switch 1
Zone A Light Bar
Zone A BE Switch 2
Zone A BE Switch 1
Zone A Node 4
Zone A Node 3
Zone A Node 2
Zone A Node 1
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Line cord 4
Line cord 3
Line cord 2
Line cord 1
J6 J5 J4 J3 J2 J1
P6 P5 P4 P3 P2 P1
038-004-186
038-004-186
Zone B
JUMPER 5 OFF
JUMPER 4 OFF
JUMPER 3 ON
JUMPER 2 OFF
JUMPER 1 ON
Zone A
JUMPER 5 OFF
JUMPER 4 OFF
JUMPER 3 ON
JUMPER 2 OFF
JUMPER 1 ON

Figure 57. EXF900 Standard Single-Phase AC 0U Cabling

Table 25. EXF900 0U PDU Cabling with Aggregation Switch

PDU Outlet	Component	Line cord per zone
37	Empty	4
36	Empty	4
35	Node 15	4
34	Node 14	4
33	Empty	4
32	Node 13	4
31	Node 12	4
30	Empty	3
29	Node 11	3
28	Node 10	3
27	Empty	3
26	Node 9	3
25	Node 8	3
24	Empty	2
23	AGG SW2	2
22	AGG SW1	2
21	Empty	2
20	Empty	2
19	Node 7	2
18	Empty	2
17	Node 6	2
16	Node 5	2
15	Empty	2
14	FE SW2	2
13	FE SW1	2
12	Zone B Service Tray/Zone A Light Bar	1
11	BE SW 2	1
10	BE SW 1	1
9	Empty	1
8	Empty	1
7	Empty	1
6	Empty	1
5	Node 4	1
4	Node 3	1
3	Empty	1
2	Node 2	1
1	Node 1	1

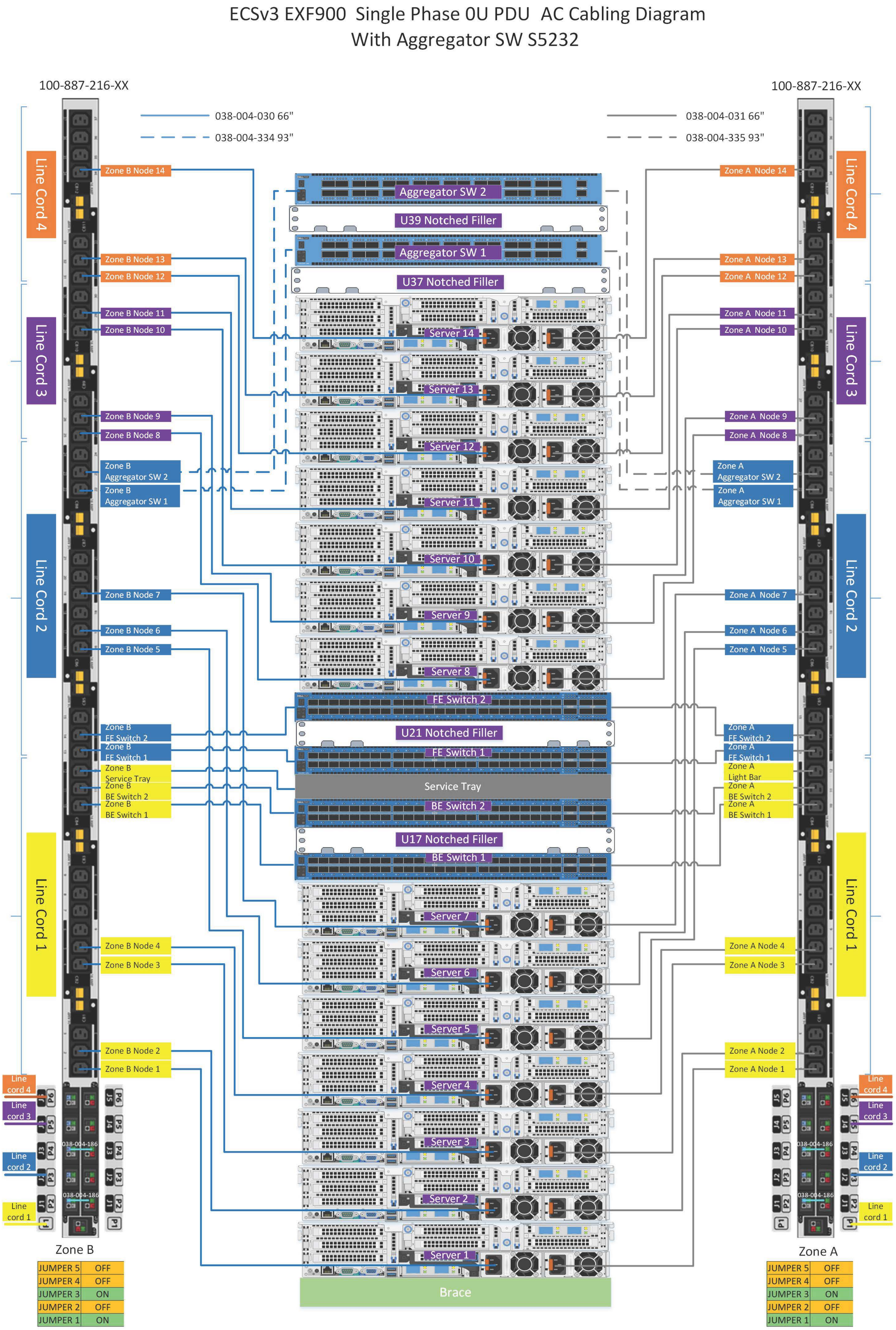

ECSv3 EXF900 Single Phase 0U PDU AC Cabling Diagram
With Aggregator SW S5232
100-887-216-XX
100-887-216-XX
038-004-030 66"
038-004-334 93"
038-004-031 66"
038-004-335 93"
Line Cord 4
Line Cord 3
Line Cord 2
Line Cord 1
Zone B Node 14
Zone B Node 13
Zone B Node 12
Zone B Node 11
Zone B Node 10
Zone B Node 9
Zone B Node 8
Zone B Aggregator SW 2
Zone B Aggregator SW 1
Zone B Node 7
Zone B Node 6
Zone B Node 5
Zone B FE Switch 2
Zone B FE Switch 1
Zone B Service Tray
Zone B BE Switch 2
Zone B BE Switch 1
Zone B Node 4
Zone B Node 3
Zone B Node 2
Zone B Node 1
Zone A Node 14
Zone A Node 13
Zone A Node 12
Zone A Node 11
Zone A Node 10
Zone A Node 9
Zone A Node 8
Zone A Aggregator SW 2
Zone A Aggregator SW 1
Zone A Node 7
Zone A Node 6
Zone A Node 5
Zone A FE Switch 2
Zone A FE Switch 1
Zone A Light Bar
Zone A BE Switch 2
Zone A BE Switch 1
Zone A Node 4
Zone A Node 3
Zone A Node 2
Zone A Node 1
Aggregator SW 2
U39 Notched Filler
Aggregator SW 1
U37 Notched Filler
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Line cord 4
Line cord 3
Line cord 2
Line cord 1
P6
P5
P4
P3
P2
P1
J5
J4
J3
J2
J1
038-004-186
038-004-186
Zone B
Zone A
JUMPER 5 OFF
JUMPER 4 OFF
JUMPER 3 ON
JUMPER 2 OFF
JUMPER 1 ON
JUMPER 5 OFF
JUMPER 4 OFF
JUMPER 3 ON
JUMPER 2 OFF
JUMPER 1 ON

Figure 58. EXF900 Single-Phase 0U Cabling with Aggregation Switch

Table 26. EXF900 Standard 0U Three-Phase PDU Cabling

PDU Outlet	Component	Line cord per zone
37	Empty	2
36	Empty	2
35	Empty	2
34	Empty	2
33	Empty	2
32	Empty	2
31	Empty	2
30	Empty	2
29	Empty	2
28	Empty	2
27	Empty	2
26	Node 16	2
25	Node 15	2
24	Empty	2
23	Node 14	2
22	Node 13	2
21	Empty	2
20	Node 12	2
19	Node 11	2
18	Empty	1
17	Node 10	1
16	Node 9	1
15	Node 8	1
14	Empty	1
13	Empty	1
12	FE SW2	1
11	FE SW1	1
10	Zone B Service Tray/Zone A Light Bar	1
9	BE SW 2	1
8	BE SW 1	1
7	Node 7	1
6	Node 6	1
5	Node 5	1
4	Node 4	1
3	Node 3	1
2	Node 2	1
1	Node 1	1

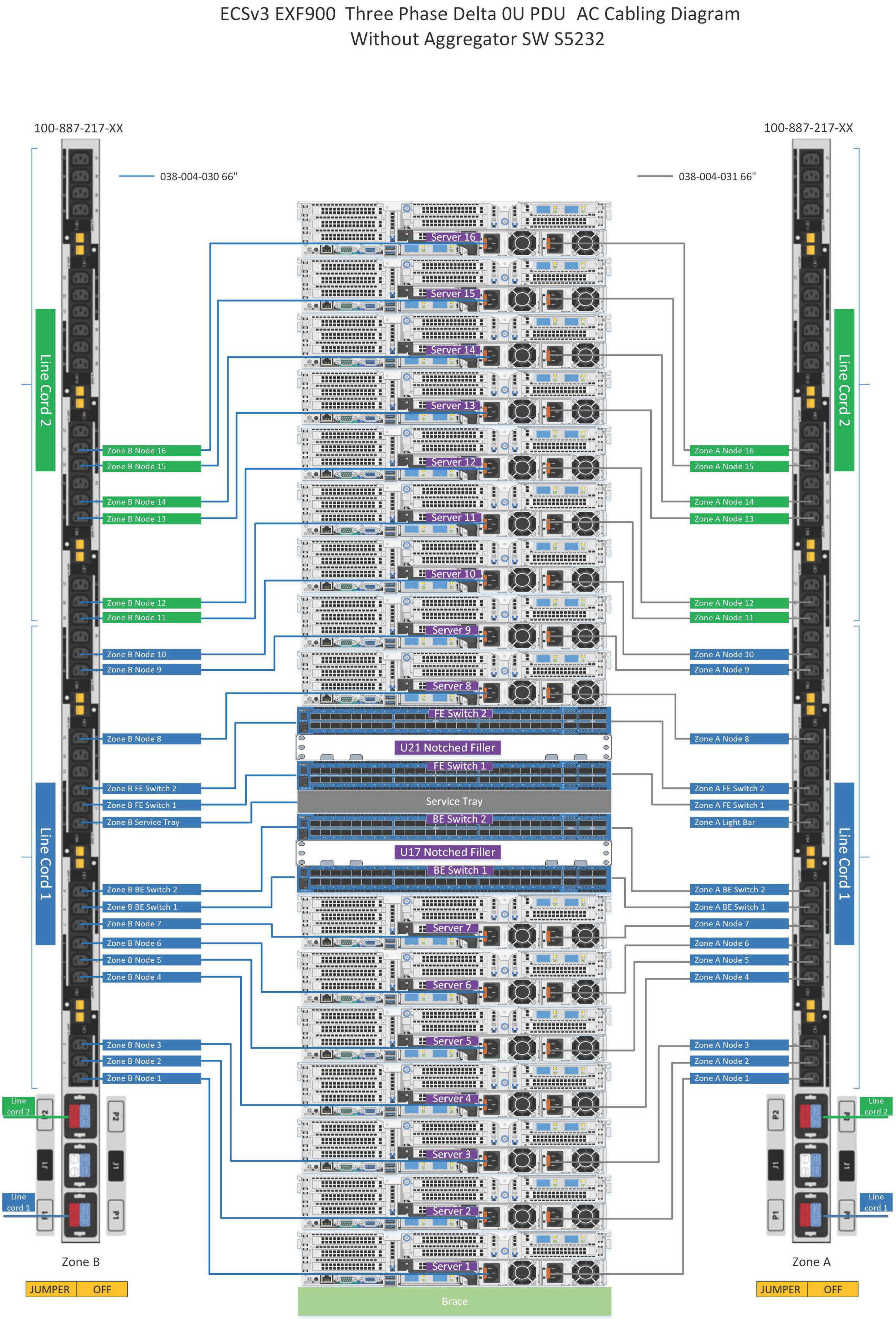

ECSv3 EXF900 Three Phase Delta 0U PDU AC Cabling Diagram
Without Aggregator SW S5232
100-887-217-XX
100-887-217-XX
038-004-030 66"
038-004-031 66"
Line Cord 2
Line Cord 1
Line Cord 2
Line Cord 1
Zone B Node 16
Zone B Node 15
Zone B Node 14
Zone B Node 13
Zone B Node 12
Zone B Node 11
Zone B Node 10
Zone B Node 9
Zone B Node 8
Zone B FE Switch 2
Zone B FE Switch 1
Zone B Service Tray
Zone B BE Switch 2
Zone B BE Switch 1
Zone B Node 7
Zone B Node 6
Zone B Node 5
Zone B Node 4
Zone B Node 3
Zone B Node 2
Zone B Node 1
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Zone A Node 16
Zone A Node 15
Zone A Node 14
Zone A Node 13
Zone A Node 12
Zone A Node 11
Zone A Node 10
Zone A Node 9
Zone A Node 8
Zone A FE Switch 2
Zone A FE Switch 1
Zone A Light Bar
Zone A BE Switch 2
Zone A BE Switch 1
Zone A Node 7
Zone A Node 6
Zone A Node 5
Zone A Node 4
Zone A Node 3
Zone A Node 2
Zone A Node 1
Line cord 2
Line cord 1
P2
J1
P1
Line cord 2
Line cord 1
Zone B
JUMPER
OFF
Zone A
JUMPER
OFF

Figure 59. EXF900 Standard Delta 0U Cabling

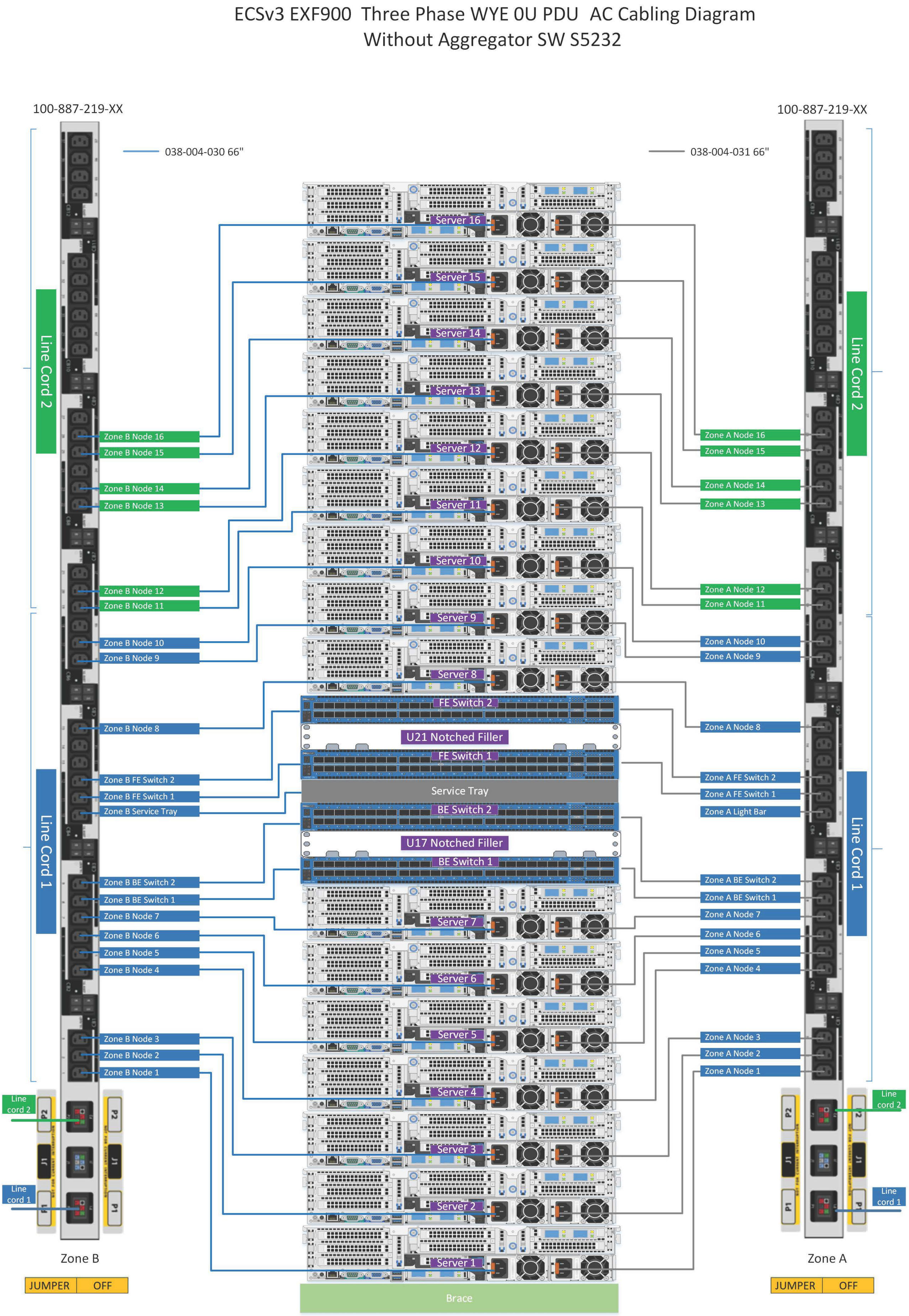

ECSv3 EXF900 Three Phase WYE 0U PDU AC Cabling Diagram
Without Aggregator SW S5232
100-887-219-XX
100-887-219-XX
038-004-030 66"
038-004-031 66"
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Line Cord 2
Line Cord 1
Line Cord 2
Line Cord 1
Zone B Node 16
Zone B Node 15
Zone B Node 14
Zone B Node 13
Zone B Node 12
Zone B Node 11
Zone B Node 10
Zone B Node 9
Zone B Node 8
Zone B FE Switch 2
Zone B FE Switch 1
Zone B Service Tray
Zone B BE Switch 2
Zone B BE Switch 1
Zone B Node 7
Zone B Node 6
Zone B Node 5
Zone B Node 4
Zone B Node 3
Zone B Node 2
Zone B Node 1
Zone A Node 16
Zone A Node 15
Zone A Node 14
Zone A Node 13
Zone A Node 12
Zone A Node 11
Zone A Node 10
Zone A Node 9
Zone A Node 8
Zone A FE Switch 2
Zone A FE Switch 1
Zone A Light Bar
Zone A BE Switch 2
Zone A BE Switch 1
Zone A Node 7
Zone A Node 6
Zone A Node 5
Zone A Node 4
Zone A Node 3
Zone A Node 2
Zone A Node 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
P2
J1
P1
P2
J1
P1
Zone B
Zone A
JUMPER
OFF
JUMPER
OFF

Figure 60. EXF900 Standard Three-Phase WYE 0U Cabling

Table 27. EXF900 Three-Phase 0U Cabling with Aggregation Switch

PDU Outlet	Component	Line cord per zone
37	Empty	2
36	Empty	2
35	Empty	2
34	Empty	2
33	Empty	2
32	Empty	2
31	Empty	2
30	Empty	2
29	Empty	2
28	Empty	2
27	Empty	2
26	Node 15	2
25	Node 14	2
24	Empty	2
23	Node 13	2
22	Node 12	2
21	Empty	2
20	Node 11	2
19	Node 10	2
18	Empty	1
17	Node 9	1
16	Node 8	1
15	Empty	1
14	AGG SW2	1
13	AGG SW1	1
12	FE SW2	1
11	FE SW1	1
10	Zone B Service Tray/Zone A Light Bar	1
9	BE SW 2	1
8	BE SW 1	1
7	Node 7	1
6	Node 6	1
5	Node 5	1
4	Node 4	1
3	Node 3	1
2	Node 2	1
1	Node 1	1

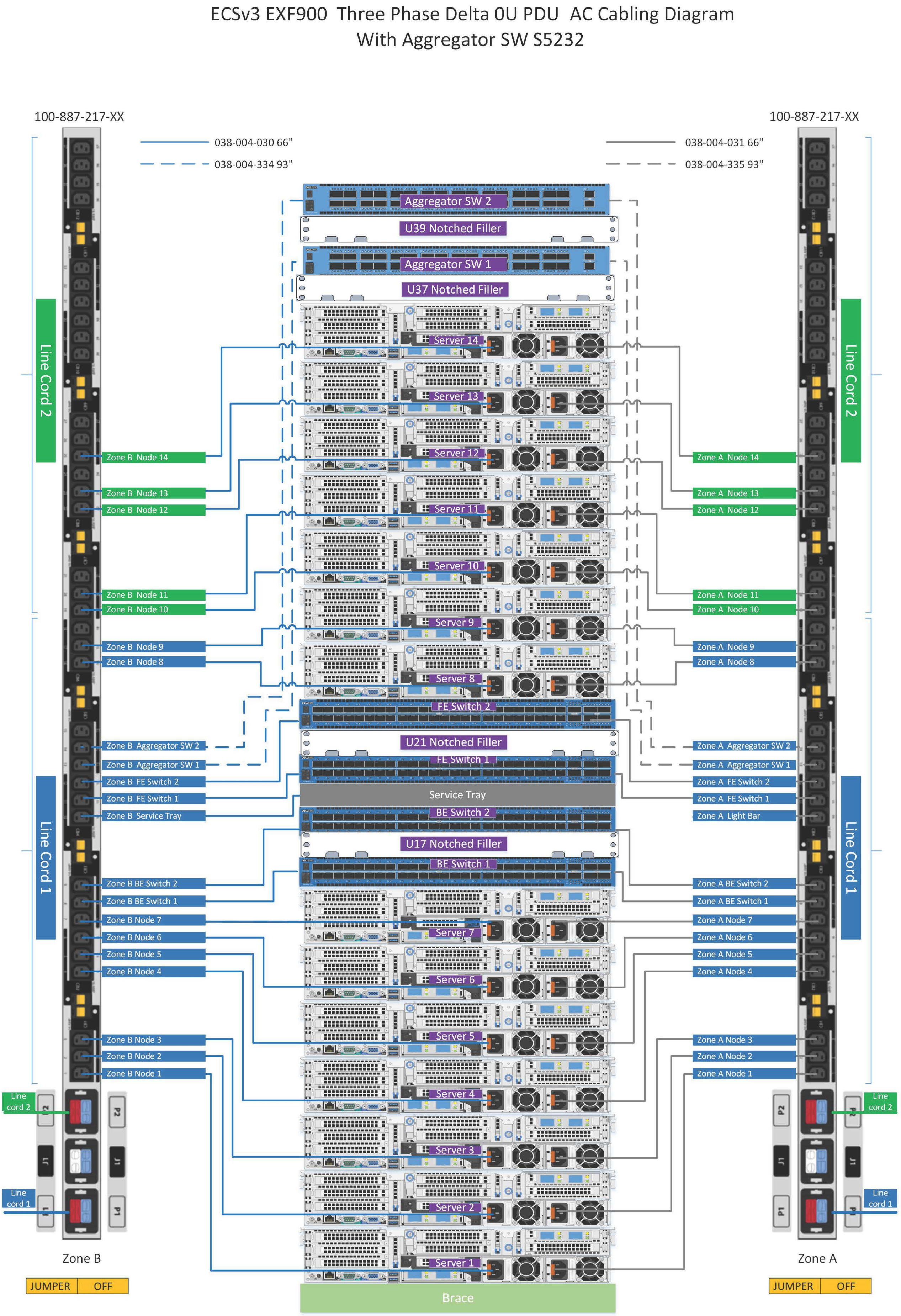

ECSv3 EXF900 Three Phase Delta 0U PDU AC Cabling Diagram
With Aggregator SW S5232
100-887-217-XX
100-887-217-XX
038-004-030 66"
038-004-334 93"
038-004-031 66"
038-004-335 93"
Aggregator SW 2
U39 Notched Filler
Aggregator SW 1
U37 Notched Filler
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Line Cord 2
Line Cord 1
Line Cord 2
Line Cord 1
Zone B Node 14
Zone B Node 13
Zone B Node 12
Zone B Node 11
Zone B Node 10
Zone B Node 9
Zone B Node 8
Zone B Aggregator SW 2
Zone B Aggregator SW 1
Zone B FE Switch 2
Zone B FE Switch 1
Zone B Service Tray
Zone B BE Switch 2
Zone B BE Switch 1
Zone B Node 7
Zone B Node 6
Zone B Node 5
Zone B Node 4
Zone B Node 3
Zone B Node 2
Zone B Node 1
Zone A Node 14
Zone A Node 13
Zone A Node 12
Zone A Node 11
Zone A Node 10
Zone A Node 9
Zone A Node 8
Zone A Aggregator SW 2
Zone A Aggregator SW 1
Zone A FE Switch 2
Zone A FE Switch 1
Zone A Light Bar
Zone A BE Switch 2
Zone A BE Switch 1
Zone A Node 7
Zone A Node 6
Zone A Node 5
Zone A Node 4
Zone A Node 3
Zone A Node 2
Zone A Node 1
Line cord 2
Line cord 1
P2
J1
P1
Line cord 2
Line cord 1
P2
J1
P1
Zone B
JUMPER
OFF
Zone A
JUMPER
OFF

Figure 61. EXF900 Three-Phase Delta 0U PDU with Aggregation Switch AC Cabling

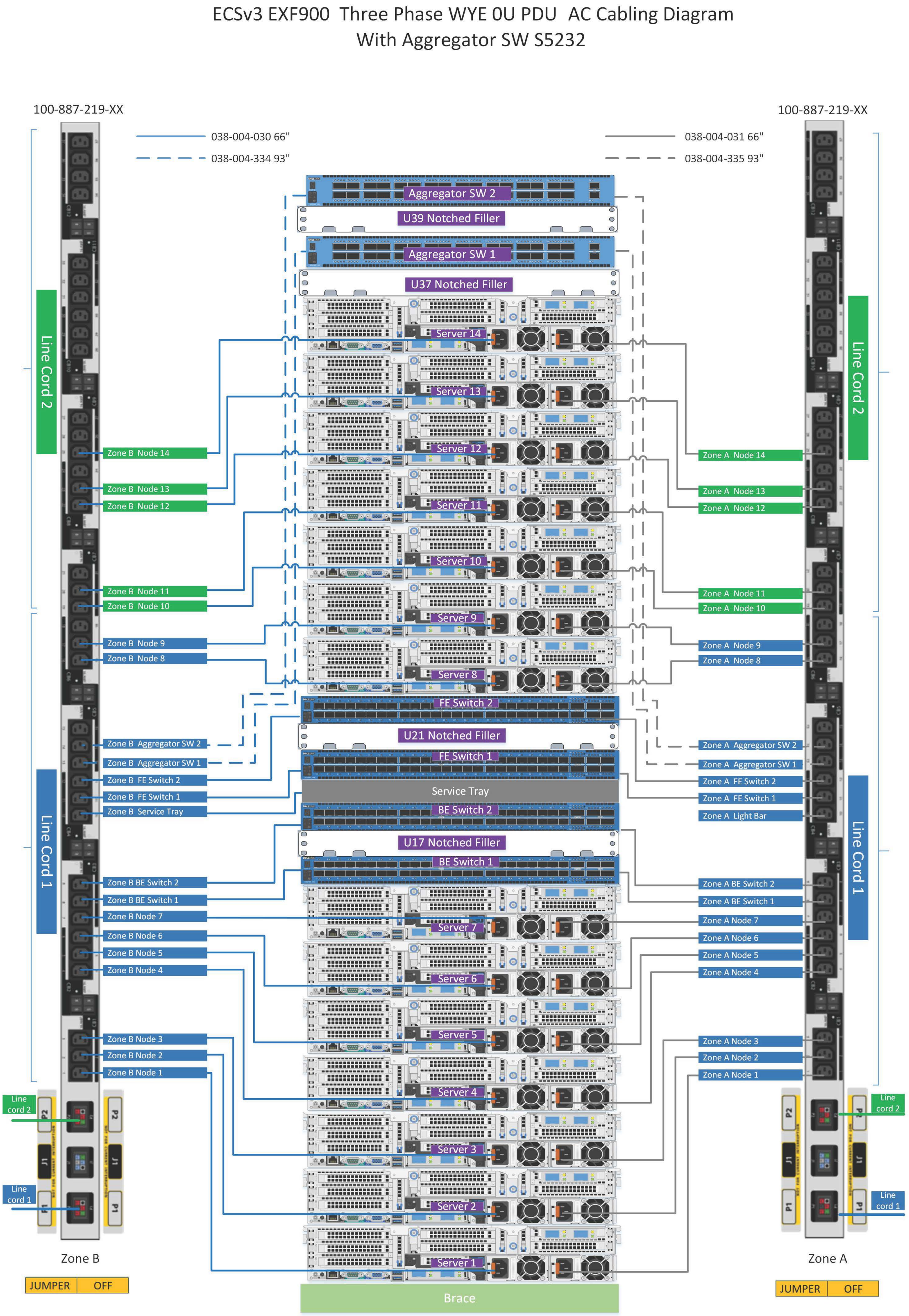

ECSv3 EXF900 Three Phase WYE 0U PDU AC Cabling Diagram
With Aggregator SW S5232
100-887-219-XX
100-887-219-XX
038-004-030 66"
038-004-334 93"
038-004-031 66"
038-004-335 93"
Aggregator SW 2
U39 Notched Filler
Aggregator SW 1
U37 Notched Filler
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Line Cord 2
Line Cord 1
Line Cord 2
Line Cord 1
Zone B Node 14
Zone B Node 13
Zone B Node 12
Zone B Node 11
Zone B Node 10
Zone B Node 9
Zone B Node 8
Zone B Aggregator SW 2
Zone B Aggregator SW 1
Zone B FE Switch 2
Zone B FE Switch 1
Zone B Service Tray
Zone B BE Switch 2
Zone B BE Switch 1
Zone B Node 7
Zone B Node 6
Zone B Node 5
Zone B Node 4
Zone B Node 3
Zone B Node 2
Zone B Node 1
Zone A Node 14
Zone A Node 13
Zone A Node 12
Zone A Node 11
Zone A Node 10
Zone A Node 9
Zone A Node 8
Zone A Aggregator SW 2
Zone A Aggregator SW 1
Zone A FE Switch 2
Zone A FE Switch 1
Zone A Light Bar
Zone A BE Switch 2
Zone A BE Switch 1
Zone A Node 7
Zone A Node 6
Zone A Node 5
Zone A Node 4
Zone A Node 3
Zone A Node 2
Zone A Node 1
Line cord 2
Line cord 1
Line cord 2
Line cord 1
P2
J1
P1
P2
J1
P1
Zone B
JUMPER
OFF
Zone A
JUMPER
OFF

Figure 62. EXF900 Three-Phase WYE 0U PDU with Aggregation Switch AC Cabling

Table 28. EXF900 Standard Single-Phase 2U PDU Cabling

PDU Outlet	Component	Line cord per zone
PDU2 16	Node 14	4
PDU2 15	Node 13	4
PDU2 14	Empty	4
PDU2 13	Empty	4
PDU2 4	Node 16	4
PDU2 3	Node 15	4
PDU2 2	Empty	4
PDU2 1	Empty	4
PDU1 24	Node 12	3
PDU1 23	Node 11	3
PDU1 22	Empty	3
PDU1 21	Empty	3
PDU1 20	Node 8	2
PDU1 19	Node 7	2
PDU1 18	Empty	2
PDU1 17	Empty	2
PDU1 16	Node 4	1
PDU1 15	Node 3	1
PDU1 14	Empty	1
PDU1 13	Zone B Service Tray/Zone A Light Bar	1
PDU1 12	Node 10	3
PDU1 11	Node 9	3
PDU1 10	Empty	3
PDU1 9	Empty	3
PDU1 8	Node 6	2
PDU1 7	Node 5	2
PDU1 6	FE SW2	2
PDU1 5	FE SW1	2
PDU1 4	Node 2	1
PDU1 3	Node 1	1
PDU1 2	BE SW2	1
PDU1 1	BE SW1	1

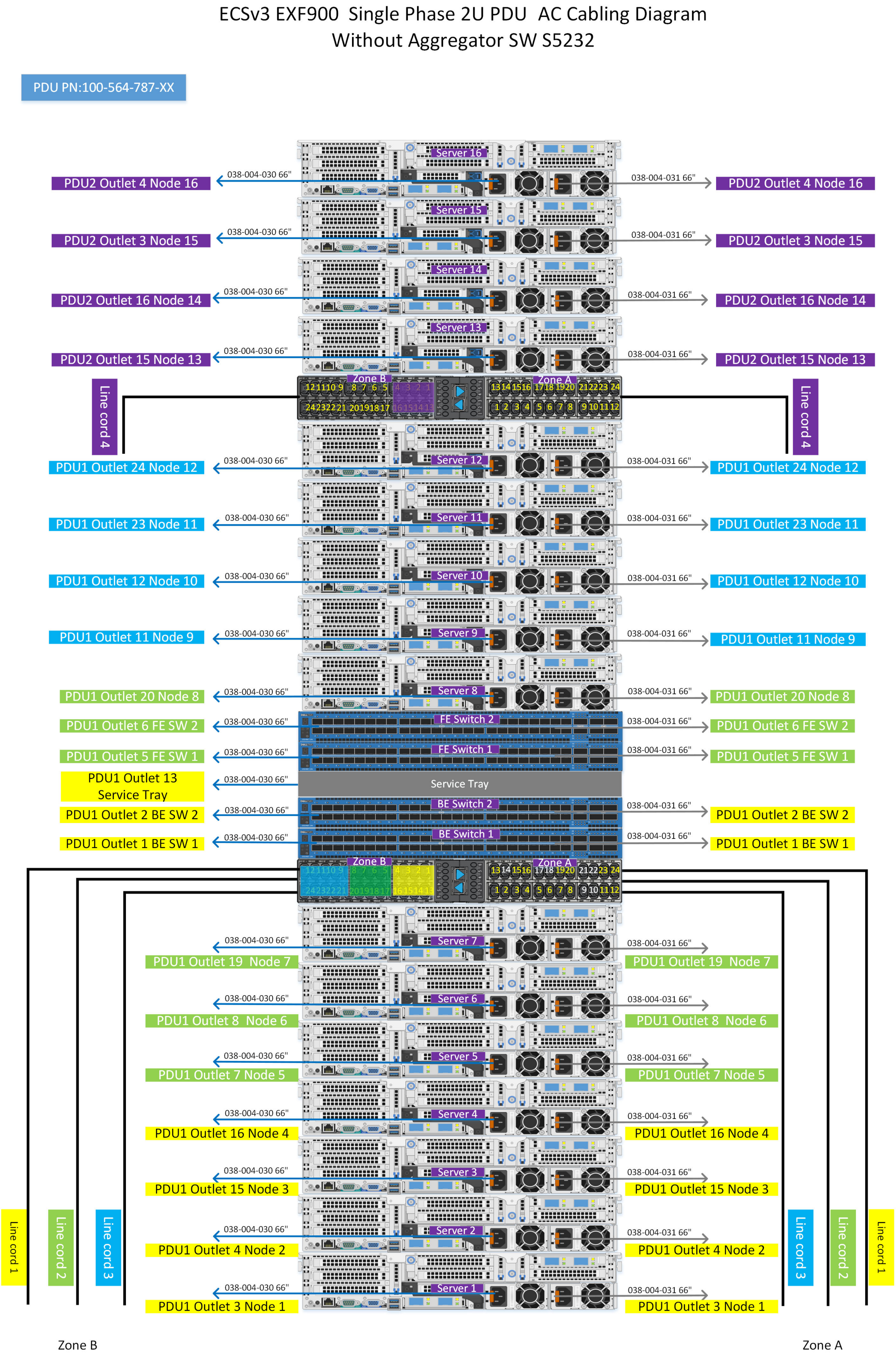

ECSv3 EXF900 Single Phase 2U PDU AC Cabling Diagram
Without Aggregator SW S5232
PDU PN:100-564-787-XX
Server 16
PDU2 Outlet 4 Node 16
038-004-030 66"
038-004-031 66"
PDU2 Outlet 4 Node 16
Server 15
PDU2 Outlet 3 Node 15
038-004-030 66"
038-004-031 66"
PDU2 Outlet 3 Node 15
Server 14
PDU2 Outlet 16 Node 14
038-004-030 66"
038-004-031 66"
PDU2 Outlet 16 Node 14
Server 13
PDU2 Outlet 15 Node 13
038-004-030 66"
038-004-031 66"
PDU2 Outlet 15 Node 13
Zone B
Zone A
Line cord 4
Line cord 4
Server 12
PDU1 Outlet 24 Node 12
038-004-030 66"
038-004-031 66"
PDU1 Outlet 24 Node 12
Server 11
PDU1 Outlet 23 Node 11
038-004-030 66"
038-004-031 66"
PDU1 Outlet 23 Node 11
Server 10
PDU1 Outlet 12 Node 10
038-004-030 66"
038-004-031 66"
PDU1 Outlet 12 Node 10
Server 9
PDU1 Outlet 11 Node 9
038-004-030 66"
038-004-031 66"
PDU1 Outlet 11 Node 9
Server 8
PDU1 Outlet 20 Node 8
038-004-030 66"
038-004-031 66"
PDU1 Outlet 20 Node 8
FE Switch 2
PDU1 Outlet 6 FE SW 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 6 FE SW 2
FE Switch 1
PDU1 Outlet 5 FE SW 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 5 FE SW 1
PDU1 Outlet 13 Service Tray
038-004-030 66"
Service Tray
BE Switch 2
PDU1 Outlet 2 BE SW 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 2 BE SW 2
BE Switch 1
PDU1 Outlet 1 BE SW 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 1 BE SW 1
Zone B
Zone A
Server 7
PDU1 Outlet 19 Node 7
038-004-030 66"
038-004-031 66"
PDU1 Outlet 19 Node 7
Server 6
PDU1 Outlet 8 Node 6
038-004-030 66"
038-004-031 66"
PDU1 Outlet 8 Node 6
Server 5
PDU1 Outlet 7 Node 5
038-004-030 66"
038-004-031 66"
PDU1 Outlet 7 Node 5
Server 4
PDU1 Outlet 16 Node 4
038-004-030 66"
038-004-031 66"
PDU1 Outlet 16 Node 4
Server 3
PDU1 Outlet 15 Node 3
038-004-030 66"
038-004-031 66"
PDU1 Outlet 15 Node 3
Server 2
PDU1 Outlet 4 Node 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 4 Node 2
Server 1
PDU1 Outlet 3 Node 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 3 Node 1
Line cord 1
Line cord 2
Line cord 3
Line cord 3
Line cord 2
Line cord 1
Zone B
Zone A

Figure 63. EXF900 Standard Single-Phase 2U PDU AC Cabling

Table 29. EXF900 Single-Phase 2U PDU Cabling with Aggregation Switch

PDU Outlet	Component	Line cord per zone
PDU2 16	Node 13	4
PDU2 15	Node 12	4
PDU2 14	Empty	4
PDU2 13	Empty	4
PDU2 4	Node 15	4
PDU2 3	Node 14	4
PDU2 2	Empty	4
PDU2 1	Empty	4
PDU1 24	Node 11	3
PDU1 23	Node 10	3
PDU1 22	Empty	3
PDU1 21	Empty	3
PDU1 20	Empty	2
PDU1 19	Node 7	2
PDU1 18	AGG SW2	2
PDU1 17	AGG SW1	2
PDU1 16	Node 4	1
PDU1 15	Node 3	1
PDU1 14	Empty	1
PDU1 13	Zone B Service Tray/Zone A Light Bar	1
PDU1 12	Node 9	3
PDU1 11	Node 8	3
PDU1 10	Empty	3
PDU1 9	Empty	3
PDU1 8	Node 6	2
PDU1 7	Node 5	2
PDU1 6	FE SW2	2
PDU1 5	FE SW1	2
PDU1 4	Node 2	1
PDU1 3	Node 1	1
PDU1 2	BE SW2	1
PDU1 1	BE SW1	1

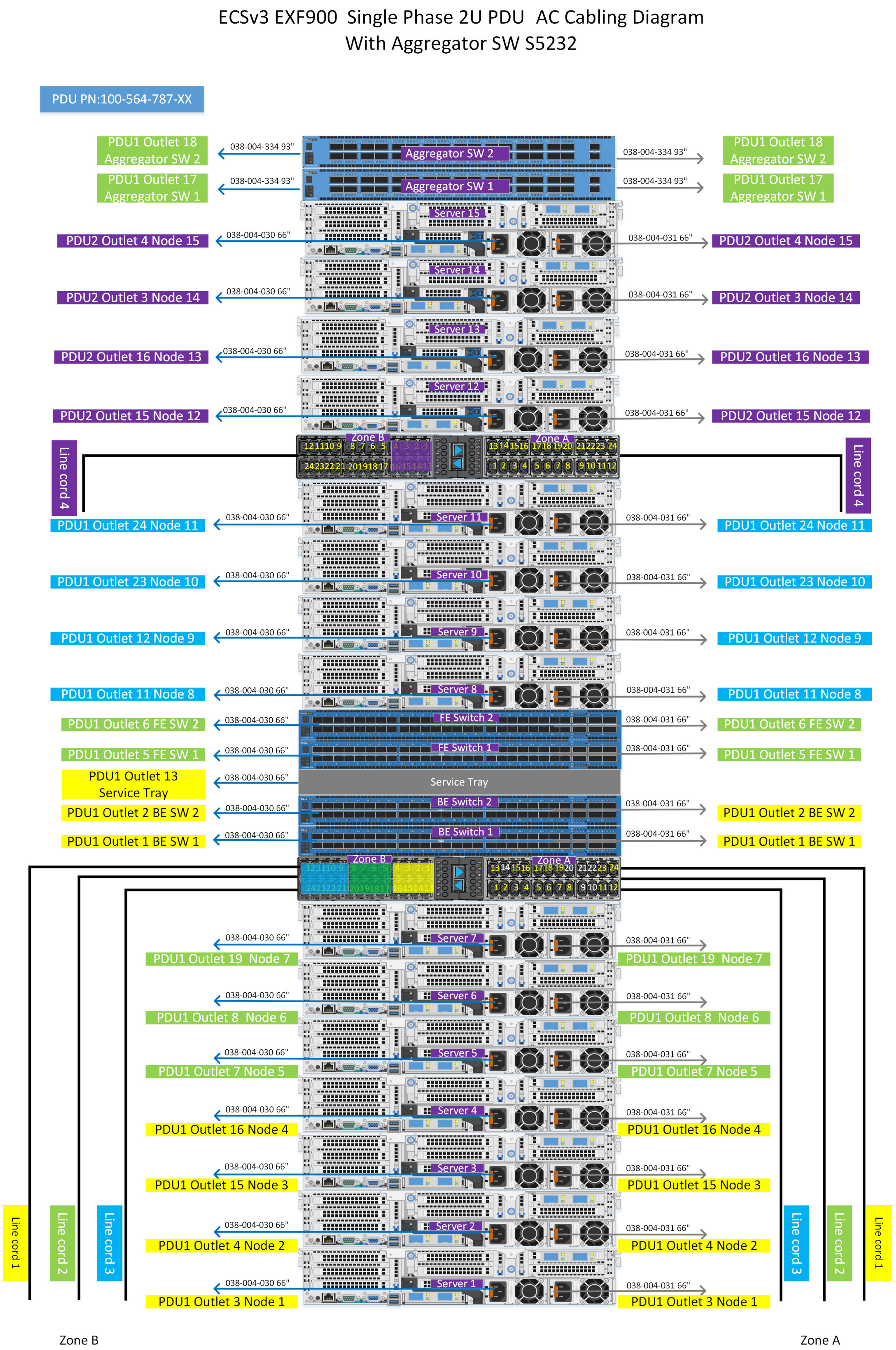

ECSv3 EXF900 Single Phase 2U PDU AC Cabling Diagram
With Aggregator SW S5232
PDU PN:100-564-787-XX
PDU1 Outlet 18 Aggregator SW 2
PDU1 Outlet 17 Aggregator SW 1
038-004-334 93"
Aggregator SW 2
Aggregator SW 1
Server 15
Server 14
Server 13
Server 12
PDU2 Outlet 4 Node 15
PDU2 Outlet 3 Node 14
PDU2 Outlet 16 Node 13
PDU2 Outlet 15 Node 12
038-004-030 66"
038-004-031 66"
Zone B
Zone A
Line cord 4
PDU1 Outlet 24 Node 11
PDU1 Outlet 23 Node 10
PDU1 Outlet 12 Node 9
PDU1 Outlet 11 Node 8
Server 11
Server 10
Server 9
Server 8
PDU1 Outlet 6 FE SW 2
PDU1 Outlet 5 FE SW 1
FE Switch 2
FE Switch 1
PDU1 Outlet 13 Service Tray
Service Tray
PDU1 Outlet 2 BE SW 2
PDU1 Outlet 1 BE SW 1
BE Switch 2
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
PDU1 Outlet 19 Node 7
PDU1 Outlet 8 Node 6
PDU1 Outlet 7 Node 5
PDU1 Outlet 16 Node 4
PDU1 Outlet 15 Node 3
PDU1 Outlet 4 Node 2
PDU1 Outlet 3 Node 1
Line cord 1
Line cord 2
Line cord 3
Zone B
Zone A

Figure 64. EXF900 Single-Phase 2U PDU Cabling with Aggregation Switch

Table 30. EXF900 Standard Three-Phase 2U PDU Cabling

PDU Outlet	Component	Line cord per zone
PDU2 16	Node 14	2
PDU2 15	Node 13	2
PDU2 14	Empty	2
PDU2 13	Empty	2
PDU2 4	Node 16	2
PDU2 3	Node 15	2
PDU2 2	Empty	2
PDU2 1	Empty	2
PDU1 24	Node 12	1
PDU1 23	Node 11	1
PDU1 22	Empty	1
PDU1 21	Empty	1
PDU1 20	Node 8	1
PDU1 19	Node 7	1
PDU1 18	Empty	1
PDU1 17	Empty	1
PDU1 16	Node 4	1
PDU1 15	Node 3	1
PDU1 14	Empty	1
PDU1 13	Zone B Service Tray/Zone A Light Bar	1
PDU1 12	Node 10	1
PDU1 11	Node 9	1
PDU1 10	Empty	1
PDU1 9	Empty	1
PDU1 8	Node 6	1
PDU1 7	Node 5	1
PDU1 6	FE SW2	1
PDU1 5	FE SW1	1
PDU1 4	Node 2	1
PDU1 3	Node 1	1
PDU1 2	BE SW2	1
PDU1 1	BE SW1	1

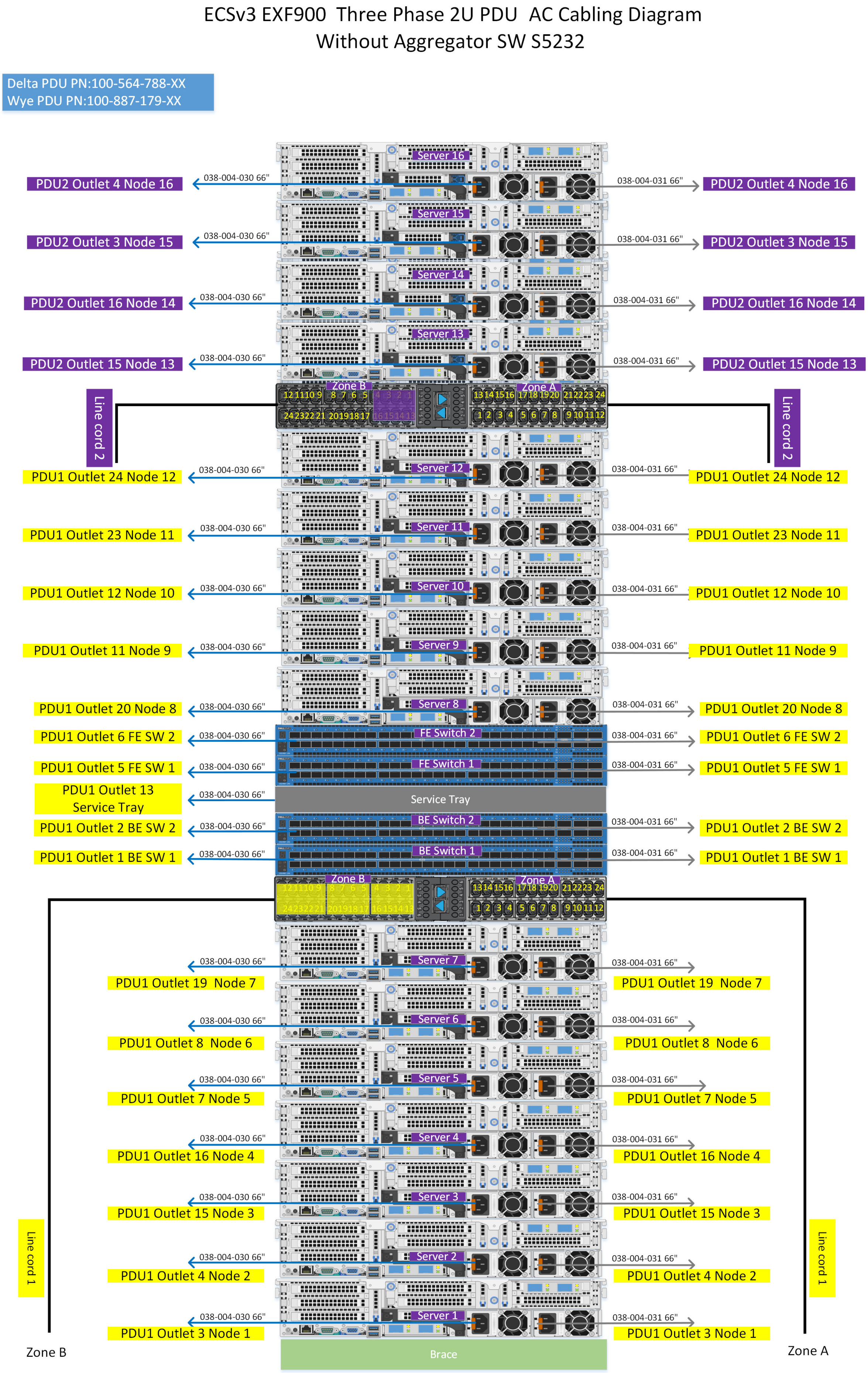

ECSv3 EXF900 Three Phase 2U PDU AC Cabling Diagram
Without Aggregator SW S5232
Delta PDU PN:100-564-788-XX
Wye PDU PN:100-887-179-XX
Server 16
PDU2 Outlet 4 Node 16
038-004-030 66"
038-004-031 66"
PDU2 Outlet 4 Node 16
Server 15
PDU2 Outlet 3 Node 15
038-004-030 66"
038-004-031 66"
PDU2 Outlet 3 Node 15
Server 14
PDU2 Outlet 16 Node 14
038-004-030 66"
038-004-031 66"
PDU2 Outlet 16 Node 14
Server 13
PDU2 Outlet 15 Node 13
038-004-030 66"
038-004-031 66"
PDU2 Outlet 15 Node 13
Zone B
Zone A
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
Line cord 2
Line cord 2
Server 12
PDU1 Outlet 24 Node 12
038-004-030 66"
038-004-031 66"
PDU1 Outlet 24 Node 12
Server 11
PDU1 Outlet 23 Node 11
038-004-030 66"
038-004-031 66"
PDU1 Outlet 23 Node 11
Server 10
PDU1 Outlet 12 Node 10
038-004-030 66"
038-004-031 66"
PDU1 Outlet 12 Node 10
Server 9
PDU1 Outlet 11 Node 9
038-004-030 66"
038-004-031 66"
PDU1 Outlet 11 Node 9
Server 8
PDU1 Outlet 20 Node 8
038-004-030 66"
038-004-031 66"
PDU1 Outlet 20 Node 8
FE Switch 2
PDU1 Outlet 6 FE SW 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 6 FE SW 2
FE Switch 1
PDU1 Outlet 5 FE SW 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 5 FE SW 1
Service Tray
PDU1 Outlet 13 Service Tray
038-004-030 66"
BE Switch 2
PDU1 Outlet 2 BE SW 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 2 BE SW 2
BE Switch 1
PDU1 Outlet 1 BE SW 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 1 BE SW 1
Zone B
Zone A
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
Server 7
038-004-030 66"
038-004-031 66"
PDU1 Outlet 19 Node 7
PDU1 Outlet 19 Node 7
Server 6
038-004-030 66"
038-004-031 66"
PDU1 Outlet 8 Node 6
PDU1 Outlet 8 Node 6
Server 5
038-004-030 66"
038-004-031 66"
PDU1 Outlet 7 Node 5
PDU1 Outlet 7 Node 5
Server 4
038-004-030 66"
038-004-031 66"
PDU1 Outlet 16 Node 4
PDU1 Outlet 16 Node 4
Server 3
038-004-030 66"
038-004-031 66"
PDU1 Outlet 15 Node 3
PDU1 Outlet 15 Node 3
Server 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 4 Node 2
PDU1 Outlet 4 Node 2
Server 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 3 Node 1
PDU1 Outlet 3 Node 1
Line cord 1
Line cord 1
Zone B
Brace
Zone A

Figure 65. EXF900 Standard Three-Phase 2U PDU AC Cabling

Table 31. EXF900 Three-Phase 2U PDU with Aggregation Switch Cabling

PDU Outlet	Component	Line cord per zone
PDU2 16	Node 13	2
PDU2 15	Node 12	2
PDU2 14	Empty	2
PDU2 13	Empty	2
PDU2 4	Node 15	2
PDU2 3	Node 14	2
PDU2 2	Empty	2
PDU2 1	Empty	2
PDU1 24	Node 11	1
PDU1 23	Node 10	1
PDU1 22	Empty	1
PDU1 21	Empty	1
PDU1 20	Empty	1
PDU1 19	Node 7	1
PDU1 18	AGG SW2	1
PDU1 17	AGG SW1	1
PDU1 16	Node 4	1
PDU1 15	Node 3	1
PDU1 14	Empty	1
PDU1 13	Zone B Service Tray/Zone A Light Bar	1
PDU1 12	Node 9	1
PDU1 11	Node 8	1
PDU1 10	Empty	1
PDU1 9	Empty	1
PDU1 8	Node 6	1
PDU1 7	Node 5	1
PDU1 6	FE SW2	1
PDU1 5	FE SW1	1
PDU1 4	Node 2	1
PDU1 3	Node 1	1
PDU1 2	BE SW2	1
PDU1 1	BE SW1	1

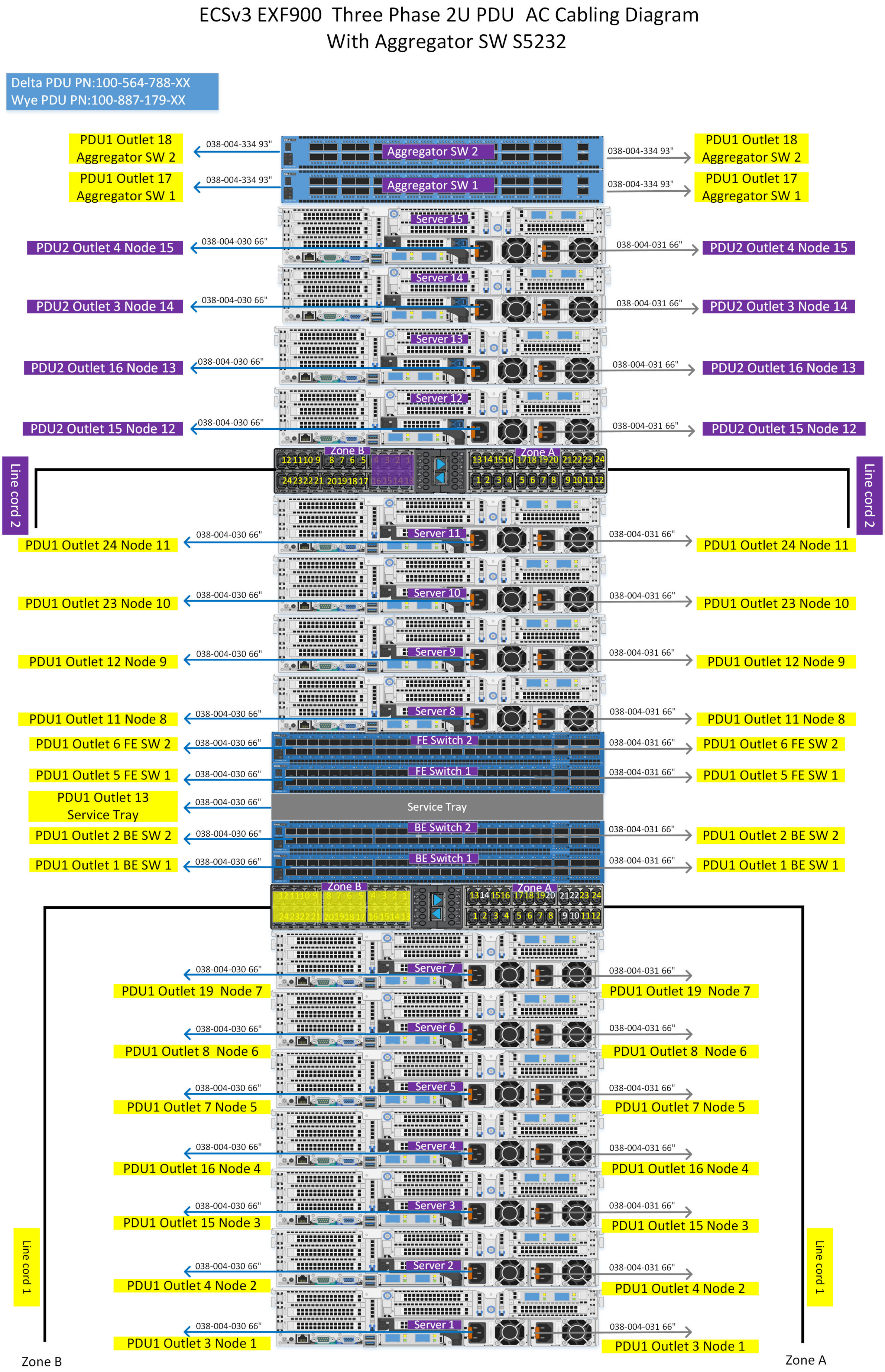

ECSv3 EXF900 Three Phase 2U PDU AC Cabling Diagram
With Aggregator SW S5232
Delta PDU PN:100-564-788-XX
Wye PDU PN:100-887-179-XX
PDU1 Outlet 18 Aggregator SW 2
038-004-334 93"
Aggregator SW 2
038-004-334 93"
PDU1 Outlet 18 Aggregator SW 2
PDU1 Outlet 17 Aggregator SW 1
038-004-334 93"
Aggregator SW 1
038-004-334 93"
PDU1 Outlet 17 Aggregator SW 1
Server 15
PDU2 Outlet 4 Node 15
038-004-030 66"
038-004-031 66"
PDU2 Outlet 4 Node 15
Server 14
PDU2 Outlet 3 Node 14
038-004-030 66"
038-004-031 66"
PDU2 Outlet 3 Node 14
Server 13
PDU2 Outlet 16 Node 13
038-004-030 66"
038-004-031 66"
PDU2 Outlet 16 Node 13
Server 12
PDU2 Outlet 15 Node 12
038-004-030 66"
038-004-031 66"
PDU2 Outlet 15 Node 12
Zone B
Zone A
Line cord 2
Line cord 2
Server 11
PDU1 Outlet 24 Node 11
038-004-030 66"
038-004-031 66"
PDU1 Outlet 24 Node 11
Server 10
PDU1 Outlet 23 Node 10
038-004-030 66"
038-004-031 66"
PDU1 Outlet 23 Node 10
Server 9
PDU1 Outlet 12 Node 9
038-004-030 66"
038-004-031 66"
PDU1 Outlet 12 Node 9
Server 8
PDU1 Outlet 11 Node 8
038-004-030 66"
038-004-031 66"
PDU1 Outlet 11 Node 8
FE Switch 2
PDU1 Outlet 6 FE SW 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 6 FE SW 2
FE Switch 1
PDU1 Outlet 5 FE SW 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 5 FE SW 1
PDU1 Outlet 13 Service Tray
038-004-030 66"
Service Tray
BE Switch 2
PDU1 Outlet 2 BE SW 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 2 BE SW 2
BE Switch 1
PDU1 Outlet 1 BE SW 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 1 BE SW 1
Zone B
Zone A
Server 7
038-004-030 66"
038-004-031 66"
PDU1 Outlet 19 Node 7
PDU1 Outlet 19 Node 7
Server 6
038-004-030 66"
038-004-031 66"
PDU1 Outlet 8 Node 6
PDU1 Outlet 8 Node 6
Server 5
038-004-030 66"
038-004-031 66"
PDU1 Outlet 7 Node 5
PDU1 Outlet 7 Node 5
Server 4
038-004-030 66"
038-004-031 66"
PDU1 Outlet 16 Node 4
PDU1 Outlet 16 Node 4
Server 3
038-004-030 66"
038-004-031 66"
PDU1 Outlet 15 Node 3
PDU1 Outlet 15 Node 3
Server 2
038-004-030 66"
038-004-031 66"
PDU1 Outlet 4 Node 2
PDU1 Outlet 4 Node 2
Server 1
038-004-030 66"
038-004-031 66"
PDU1 Outlet 3 Node 1
PDU1 Outlet 3 Node 1
Line cord 1
Line cord 1
Zone B
Zone A

Figure 66. EXF900 Three-Phase 2U PDU with Aggregation Switch AC Cabling

EXF900 iDRAC cabling

This section provides wiring diagrams for the iDRAC cables that connect the iDRAC port on the node to the Fox back-end switch.

The Fox switch (BE1) port numbers used for connecting to the iDRAC ports on the EXF900 nodes are shown in the following diagram.

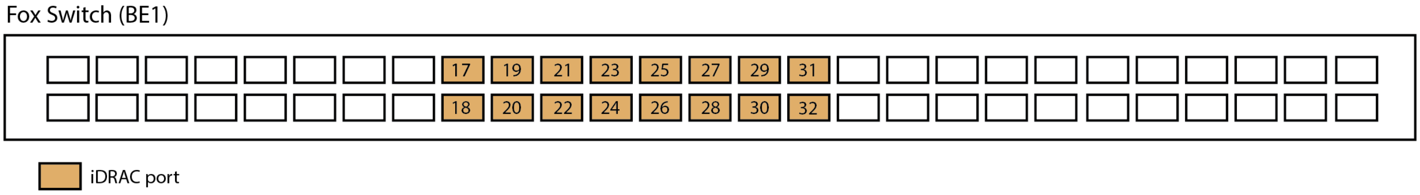


Figure 67. Fox switch iDRAC ports

The EXF900 node iDRAC port to the Fox switch (BE1) port connections are listed in the following table.

Table 32. EXF900 node iDRAC port to BE1 port mapping

Node 1 iDRAC port	BE1 Port 17
Node 2 iDRAC port	BE1 Port 18
Node 3 iDRAC port	BE1 Port 19
Node 4 iDRAC port	BE1 Port 20
Node 5 iDRAC port	BE1 Port 21
Node 6 iDRAC port	BE1 Port 22
Node 7 iDRAC port	BE1 Port 23
Node 8 iDRAC port	BE1 Port 24
Node 9 iDRAC port	BE1 Port 25
Node 10 iDRAC port	BE1 Port 26
Node 11 iDRAC port	BE1 Port 27
Node 12 iDRAC port	BE1 Port 28
Node 13 iDRAC port	BE1 Port 29
Node 14 iDRAC port	BE1 Port 30
Node 15 iDRAC port	BE1 Port 31
Node 16 iDRAC port	BE1 Port 32

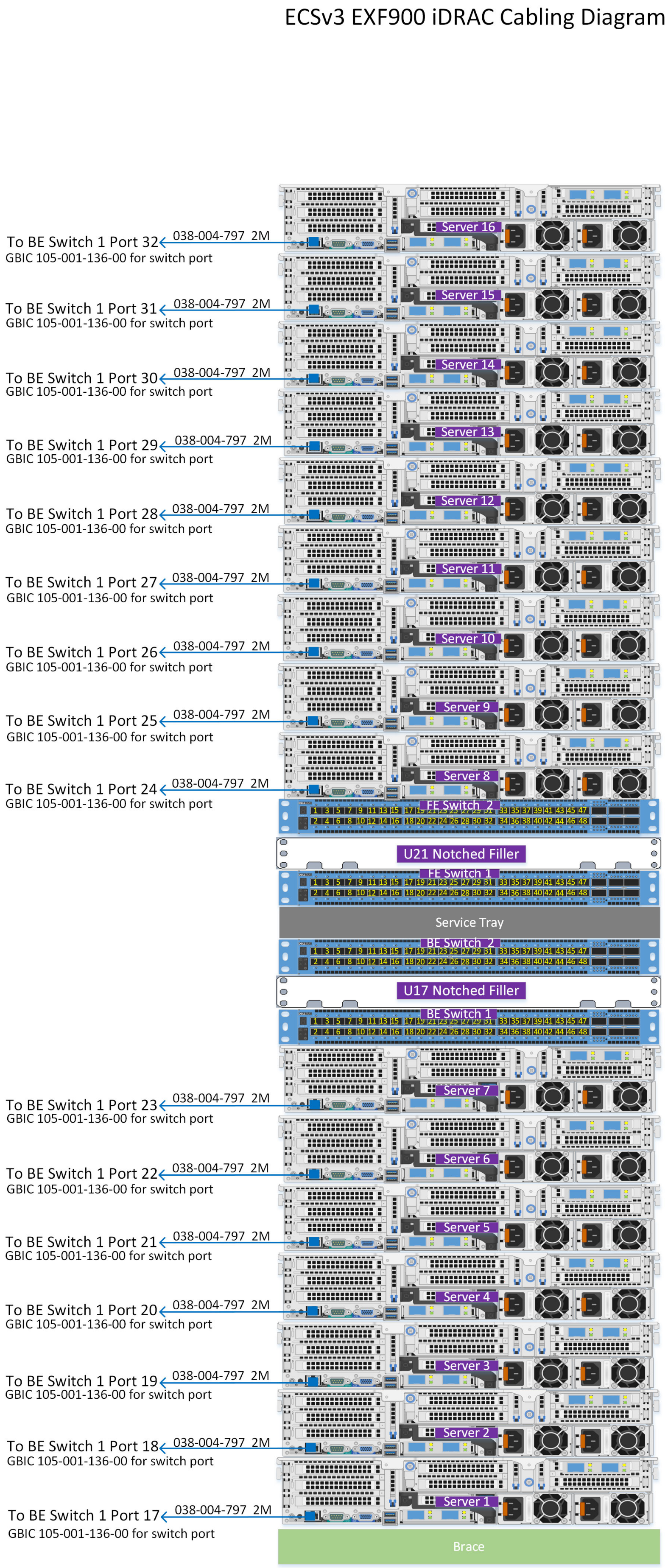

ECSv3 EXF900 iDRAC Cabling Diagram
Server 16
To BE Switch 1 Port 32
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 15
To BE Switch 1 Port 31
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 14
To BE Switch 1 Port 30
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 13
To BE Switch 1 Port 29
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 12
To BE Switch 1 Port 28
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 11
To BE Switch 1 Port 27
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 10
To BE Switch 1 Port 26
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 9
To BE Switch 1 Port 25
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 8
To BE Switch 1 Port 24
038-004-797 2M
GBIC 105-001-136-00 for switch port
FE Switch 2
U21 Notched Filler
FE Switch 1
Service Tray
BE Switch 2
U17 Notched Filler
BE Switch 1
Server 7
To BE Switch 1 Port 23
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 6
To BE Switch 1 Port 22
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 5
To BE Switch 1 Port 21
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 4
To BE Switch 1 Port 20
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 3
To BE Switch 1 Port 19
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 2
To BE Switch 1 Port 18
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 1
To BE Switch 1 Port 17
038-004-797 2M
GBIC 105-001-136-00 for switch port
Brace

Figure 68. EXF900 iDRAC cabling

EXF900 network cabling

The network cabling diagrams apply to the EXF900 appliance in a Dell Technologies or customer-provided rack.

Customers connect to an EXF900 appliance by way of 25 GbE ports on the front-end switches. For an EXF900 appliance, the 25GbE ports run at 25GbE. Customer configurations can include 25 GbE front-end switches provided by Dell Technologies or customers may provide their own front-end switches.

To distinguish between the two front-end switches and the two back-end switches, each switch has a nickname:

- Hare: The top S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to EXF900 nodes.
- Rabbit: The bottom S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to EXF900 nodes.
- Hound: The top S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the nodes.
- Fox: The bottom S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the nodes.

The front-end switch and back-end switch connections to an EXF900 node are shown in the following diagram.

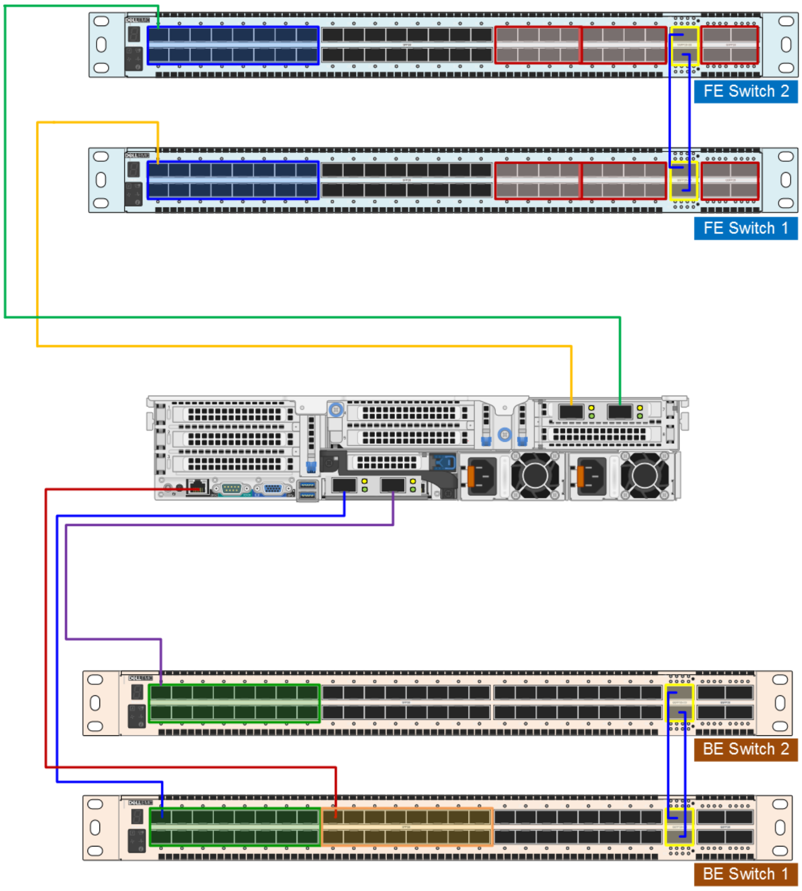


Figure 69. Front-end and back-end switch connections to an EXF900 node

The numbered front-end switch ports used for connecting to the ports on the EXF900 nodes are shown in the following diagram. Port 1 on the Hare switch (FE2) connects to port 4 on Node 1. Port 2 on the Hare switch (FE2) connects to port 4 on Node 2, and so on. Similarly, Port 1 on the Rabbit switch (FE1) connects to port 3 on Node 1. Port 2 on the Rabbit switch (FE1) connects to port 3 on Node 2, and so on.

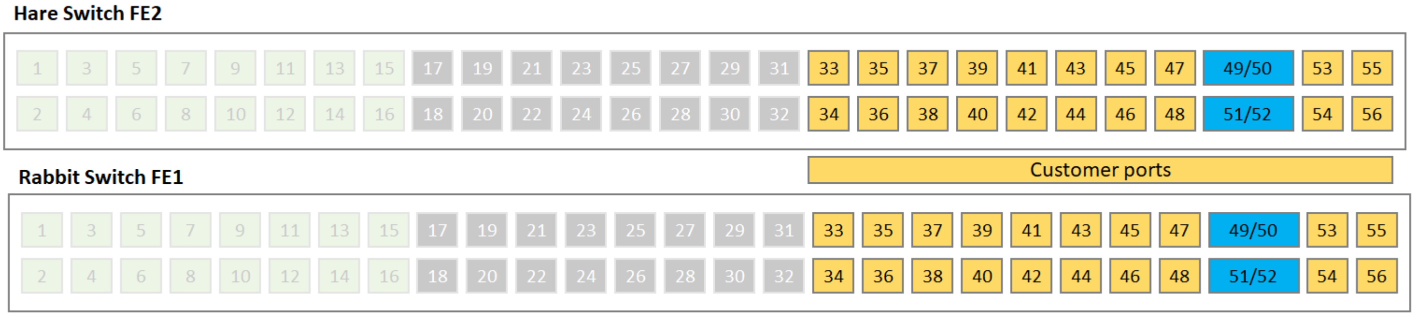

Hare Switch FE2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56
Customer ports
Rabbit Switch FE1
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56

Figure 70. Node ports on front-end switches

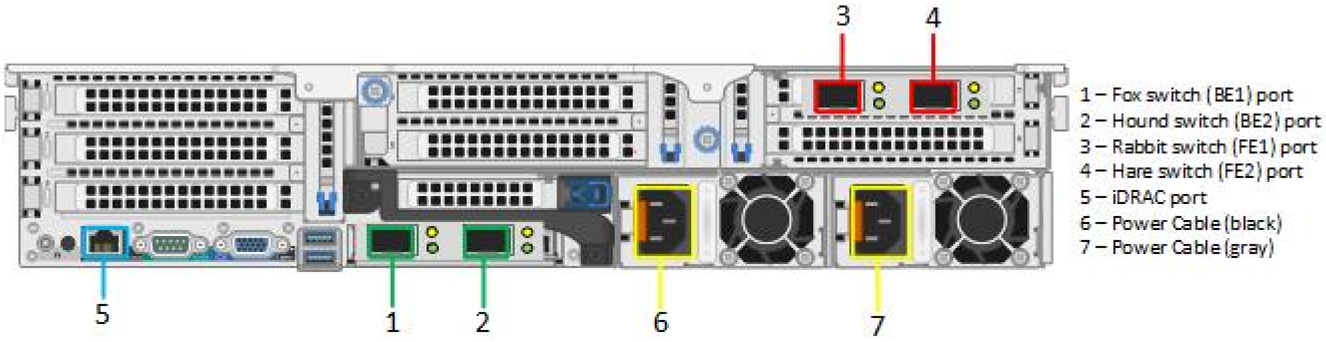

3
4
5
1
2
6
7
1 – Fox switch (BE1) port
2 – Hound switch (BE2) port
3 – Rabbit switch (FE1) port
4 – Hare switch (FE2) port
5 – iDRAC port
6 – Power Cable (black)
7 – Power Cable (gray)

Figure 71. Back-end switch, front-end switch, and iDRAC ports on an EXF900 node

The numbered back-end switch ports used for connecting to the ports on the EXF900 nodes are shown in the following diagram. Port 1 on the Hound switch (BE2) connects to port 2 on Node 1. Port 2 on the Hound switch (BE2) connects to port 2 on Node 2, and so on. Similarly, Port 1 on the Fox switch (BE1) connects to port 1 on Node 1. Port 2 on the Fox switch (BE1) connects to port 1 on Node 2, and so on.

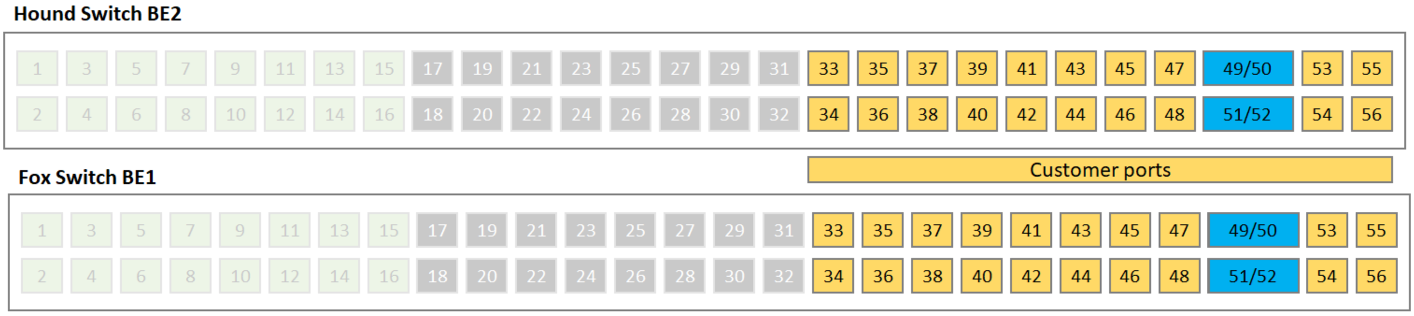
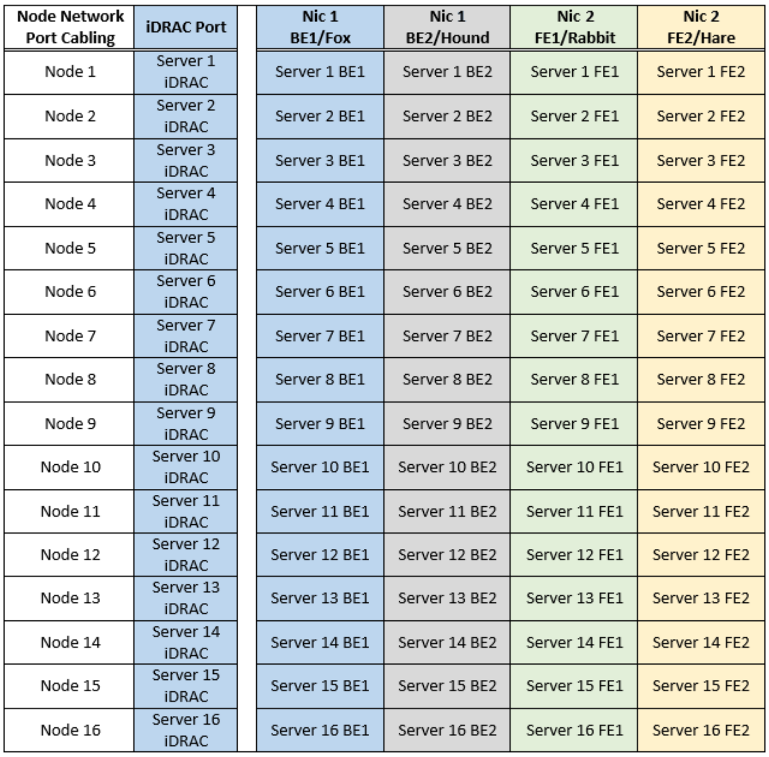

Hound Switch BE2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56
Customer ports
Fox Switch BE1
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56

Figure 72. Node ports on back-end switches

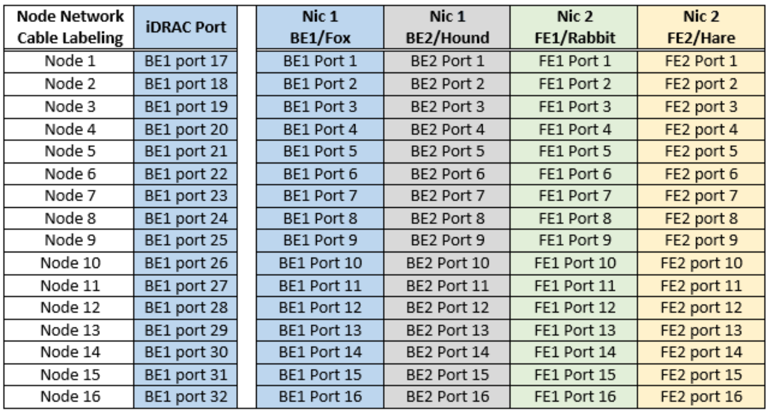
The EXF900 node port to the iDRAC, back-end switch, and front-end switch port connections are listed in the following table.



Node Network Port Cabling	iDRAC Port	Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	Server 1 iDRAC	Server 1 BE1	Server 1 BE2	Server 1 FE1	Server 1 FE2
Node 2	Server 2 iDRAC	Server 2 BE1	Server 2 BE2	Server 2 FE1	Server 2 FE2
Node 3	Server 3 iDRAC	Server 3 BE1	Server 3 BE2	Server 3 FE1	Server 3 FE2
Node 4	Server 4 iDRAC	Server 4 BE1	Server 4 BE2	Server 4 FE1	Server 4 FE2
Node 5	Server 5 iDRAC	Server 5 BE1	Server 5 BE2	Server 5 FE1	Server 5 FE2
Node 6	Server 6 iDRAC	Server 6 BE1	Server 6 BE2	Server 6 FE1	Server 6 FE2
Node 7	Server 7 iDRAC	Server 7 BE1	Server 7 BE2	Server 7 FE1	Server 7 FE2
Node 8	Server 8 iDRAC	Server 8 BE1	Server 8 BE2	Server 8 FE1	Server 8 FE2
Node 9	Server 9 iDRAC	Server 9 BE1	Server 9 BE2	Server 9 FE1	Server 9 FE2
Node 10	Server 10 iDRAC	Server 10 BE1	Server 10 BE2	Server 10 FE1	Server 10 FE2
Node 11	Server 11 iDRAC	Server 11 BE1	Server 11 BE2	Server 11 FE1	Server 11 FE2
Node 12	Server 12 iDRAC	Server 12 BE1	Server 12 BE2	Server 12 FE1	Server 12 FE2
Node 13	Server 13 iDRAC	Server 13 BE1	Server 13 BE2	Server 13 FE1	Server 13 FE2
Node 14	Server 14 iDRAC	Server 14 BE1	Server 14 BE2	Server 14 FE1	Server 14 FE2
Node 15	Server 15 iDRAC	Server 15 BE1	Server 15 BE2	Server 15 FE1	Server 15 FE2
Node 16	Server 16 iDRAC	Server 16 BE1	Server 16 BE2	Server 16 FE1	Server 16 FE2

Figure 73. EXF900 node network port cabling connections

The EXF900 node network cable labeling is listed in the following table.



Node Network Cable Labeling	iDRAC Port	Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	BE1 port 17	BE1 Port 1	BE2 Port 1	FE1 Port 1	FE2 Port 1
Node 2	BE1 port 18	BE1 Port 2	BE2 Port 2	FE1 Port 2	FE2 port 2
Node 3	BE1 port 19	BE1 Port 3	BE2 Port 3	FE1 Port 3	FE2 port 3
Node 4	BE1 port 20	BE1 Port 4	BE2 Port 4	FE1 Port 4	FE2 port 4
Node 5	BE1 port 21	BE1 Port 5	BE2 Port 5	FE1 Port 5	FE2 port 5
Node 6	BE1 port 22	BE1 Port 6	BE2 Port 6	FE1 Port 6	FE2 port 6
Node 7	BE1 port 23	BE1 Port 7	BE2 Port 7	FE1 Port 7	FE2 port 7
Node 8	BE1 port 24	BE1 Port 8	BE2 Port 8	FE1 Port 8	FE2 port 8
Node 9	BE1 port 25	BE1 Port 9	BE2 Port 9	FE1 Port 9	FE2 port 9
Node 10	BE1 port 26	BE1 Port 10	BE2 Port 10	FE1 Port 10	FE2 port 10
Node 11	BE1 port 27	BE1 Port 11	BE2 Port 11	FE1 Port 11	FE2 port 11
Node 12	BE1 port 28	BE1 Port 12	BE2 Port 12	FE1 Port 12	FE2 port 12
Node 13	BE1 port 29	BE1 Port 13	BE2 Port 13	FE1 Port 13	FE2 port 13
Node 14	BE1 port 30	BE1 Port 14	BE2 Port 14	FE1 Port 14	FE2 port 14
Node 15	BE1 port 31	BE1 Port 15	BE2 Port 15	FE1 Port 15	FE2 port 15
Node 16	BE1 port 32	BE1 Port 16	BE2 Port 16	FE1 Port 16	FE2 port 16

Figure 74. EXF900 node network cable labeling

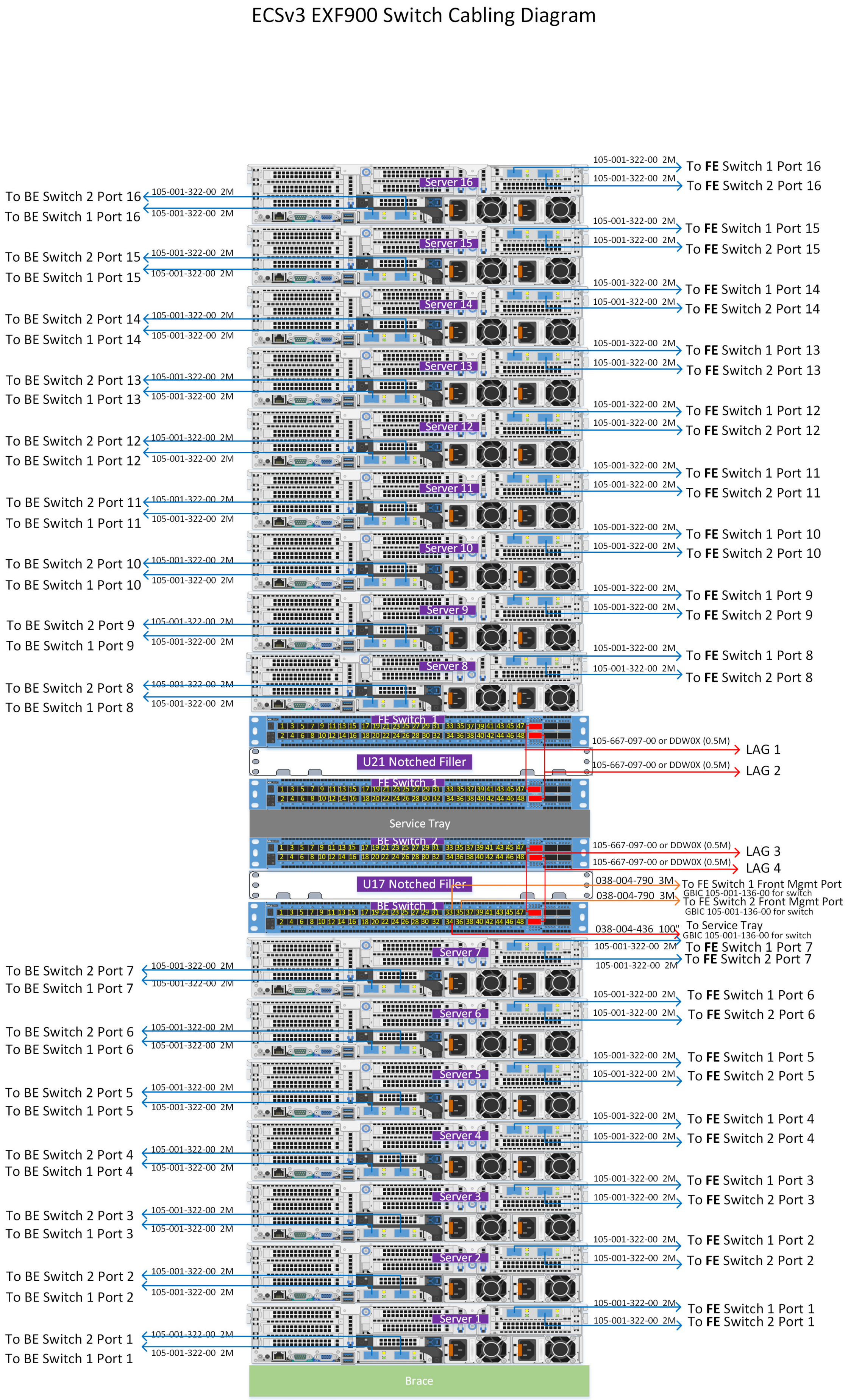

ECSv3 EXF900 Switch Cabling Diagram
Server 16
105-001-322-00 2M
To FE Switch 1 Port 16
105-001-322-00 2M
To FE Switch 2 Port 16
To BE Switch 2 Port 16
105-001-322-00 2M
To BE Switch 1 Port 16
105-001-322-00 2M
Server 15
105-001-322-00 2M
To FE Switch 1 Port 15
105-001-322-00 2M
To FE Switch 2 Port 15
To BE Switch 2 Port 15
105-001-322-00 2M
To BE Switch 1 Port 15
105-001-322-00 2M
Server 14
105-001-322-00 2M
To FE Switch 1 Port 14
105-001-322-00 2M
To FE Switch 2 Port 14
To BE Switch 2 Port 14
105-001-322-00 2M
To BE Switch 1 Port 14
105-001-322-00 2M
Server 13
105-001-322-00 2M
To FE Switch 1 Port 13
105-001-322-00 2M
To FE Switch 2 Port 13
To BE Switch 2 Port 13
105-001-322-00 2M
To BE Switch 1 Port 13
105-001-322-00 2M
Server 12
105-001-322-00 2M
To FE Switch 1 Port 12
105-001-322-00 2M
To FE Switch 2 Port 12
To BE Switch 2 Port 12
105-001-322-00 2M
To BE Switch 1 Port 12
105-001-322-00 2M
Server 11
105-001-322-00 2M
To FE Switch 1 Port 11
105-001-322-00 2M
To FE Switch 2 Port 11
To BE Switch 2 Port 11
105-001-322-00 2M
To BE Switch 1 Port 11
105-001-322-00 2M
Server 10
105-001-322-00 2M
To FE Switch 1 Port 10
105-001-322-00 2M
To FE Switch 2 Port 10
To BE Switch 2 Port 10
105-001-322-00 2M
To BE Switch 1 Port 10
105-001-322-00 2M
Server 9
105-001-322-00 2M
To FE Switch 1 Port 9
105-001-322-00 2M
To FE Switch 2 Port 9
To BE Switch 2 Port 9
105-001-322-00 2M
To BE Switch 1 Port 9
105-001-322-00 2M
Server 8
105-001-322-00 2M
To FE Switch 1 Port 8
105-001-322-00 2M
To FE Switch 2 Port 8
To BE Switch 2 Port 8
105-001-322-00 2M
To BE Switch 1 Port 8
105-001-322-00 2M
FE Switch 1
105-667-097-00 or DDW0X (0.5M)
LAG 1
U21 Notched Filler
105-667-097-00 or DDW0X (0.5M)
LAG 2
FE Switch 1
Service Tray
BE Switch 2
105-667-097-00 or DDW0X (0.5M)
LAG 3
105-667-097-00 or DDW0X (0.5M)
LAG 4
U17 Notched Filler
038-004-790 3M
To FE Switch 1 Front Mgmt Port
GBIC 105-001-136-00 for switch
038-004-790 3M
To FE Switch 2 Front Mgmt Port
GBIC 105-001-136-00 for switch
BE Switch 1
038-004-436 100"
To Service Tray
GBIC 105-001-136-00 for switch
Server 7
105-001-322-00 2M
To FE Switch 1 Port 7
To FE Switch 2 Port 7
105-001-322-00 2M
To BE Switch 2 Port 7
105-001-322-00 2M
To BE Switch 1 Port 7
105-001-322-00 2M
Server 6
105-001-322-00 2M
To FE Switch 1 Port 6
105-001-322-00 2M
To FE Switch 2 Port 6
To BE Switch 2 Port 6
105-001-322-00 2M
To BE Switch 1 Port 6
105-001-322-00 2M
Server 5
105-001-322-00 2M
To FE Switch 1 Port 5
105-001-322-00 2M
To FE Switch 2 Port 5
To BE Switch 2 Port 5
105-001-322-00 2M
To BE Switch 1 Port 5
105-001-322-00 2M
Server 4
105-001-322-00 2M
To FE Switch 1 Port 4
105-001-322-00 2M
To FE Switch 2 Port 4
To BE Switch 2 Port 4
105-001-322-00 2M
To BE Switch 1 Port 4
105-001-322-00 2M
Server 3
105-001-322-00 2M
To FE Switch 1 Port 3
105-001-322-00 2M
To FE Switch 2 Port 3
To BE Switch 2 Port 3
105-001-322-00 2M
To BE Switch 1 Port 3
105-001-322-00 2M
Server 2
105-001-322-00 2M
To FE Switch 1 Port 2
105-001-322-00 2M
To FE Switch 2 Port 2
To BE Switch 2 Port 2
105-001-322-00 2M
To BE Switch 1 Port 2
105-001-322-00 2M
Server 1
105-001-322-00 2M
To FE Switch 1 Port 1
105-001-322-00 2M
To FE Switch 2 Port 1
To BE Switch 2 Port 1
105-001-322-00 2M
To BE Switch 1 Port 1
105-001-322-00 2M
Brace

Figure 75. ECS v3 EXF900 network cabling

EXF900 Cable Kits

Learn about the cable kits required for the EXF900 system.

Table 33. Back-end cable kits

Kit contents	Number of kits required per EXF900 Node	Kit type	Models
• 2 x 25G Twin-ax cable • 1x 1 GbE CAT6 cable • 1x RJ45 SFP+ module for fox switch • Labels	One	Back-End Cabling Kits	ES6-25-1M-BE-KTS
			ES6-25-2M-BE-KTS Recommended for Dell EMC Racks
			ES6-25-3M-BE-KTS
			ES6-25-5M-BE-KTS

Table 34. Front-end cable kits

Kit contents	Number of kits required per EXF900 Node	Kit type	Models
• 2 x 25G Twin-ax cable • Labels	One, if the customer is using Dell-provided switches. 25 GbE Optics are available for the servers when customer- provided switches are installed.	Front-End Cabling Kits	ES6-25-1M-FE-KTS
			ES6-25-2M-FE-KTS Recommended for Dell EMC Racks
			ES6-25-3M-FE-KTS
			ES6-25-5M-FE-KTS

NOTE: Front-end cable kits not required when customer provides front-end switches.25 GbE Optics are available for the servers when customer- provided switches are installed.

Table 35. Aggregation connection cable kits

Kit contents	Number of kits required per EXF900 Rack	Kit type	Models
• 2 x 100G cable • Labels	Four, if expanding beyond one EXF900 rack.	Aggregation Connection Cabling Kits	ES6-100-1M-DAC-KT
			ES6-100-5M-DAC-KT
			ES6-100-10M-AOC-KT
			ES6-100-30M-AOC-KT

NOTE: For connections longer than 30M, it is recommended to purchase four 100Gb optics from the Customer Kits. Customer can provide required optical cabling.

Customer Connection Kits

EXF900 requires Customer Connection Kits to connect the Dell EMC provided Front-End switches uplinks to the customer's network.

Use 25 Gb optics (SR) SFPs in the EXF900 server front-end NIC adapter to connect to customer-provided switches. The following table provides the speed and the model details.

Table 36. Speed and model details

Speed	Model
1 Gb	ES6-1GBASET-XVR

Table 36. Speed and model details (continued)

Speed	Model
10 Gb	ES6-10GB-SR
	ES6-10GB-LR
	ES6-10GB-ER
25 Gb	ES6-25GB-SR
	ES6-25GB-LR
40 Gb	ES6-40GB-SR4
	ES6-40GB-LR4
100 Gb	ES6-100GB-SR4
	ES6-100GB-LR4
	ES6-100GB-PSM4
	ES6-100GB-QSA

Aggregated EXF900 back-end network between multiple racks

The private.4 network interconnects multiple, co-located ECS intrarack networks into a single interrack network through VLAN 4.

NOTE: The private.4 network is also called as the Nile Area Network (NAN).

Ports 53 through 56 are used to create Port-Channel 110 on the Fox and Hound switches. The ports in Port-Channel 110 are dedicated to connect to the back-end aggregation switches, Eagle, and Falcon.

NOTE: Only connection to other EXF900 nodes is allowed. EXF900 cannot join existing VDCs that include non-EXF900 nodes.

The ECS intrarack backend networks have typically been used for management purposes. New with the introduction of EXF900 is the creation of NVMe over Fabric (NVMe-oF). The EXF900 is the first release of a high performant ECS object storage appliance. The ECS software uses an NVMe engine to configure local NVMe targets and establish NVMe-oF connections. High performing and reliable connections to remote storage nodes are accomplished by having a dedicated high available network using Ethernet-based RDMA as the transport fabric. The number of uplinks between each rack and the aggregation switches ensures all the EXF900 nodes have line rate performance to any node in any rack. This setup allows for low latency and high throughput across the entire cluster.

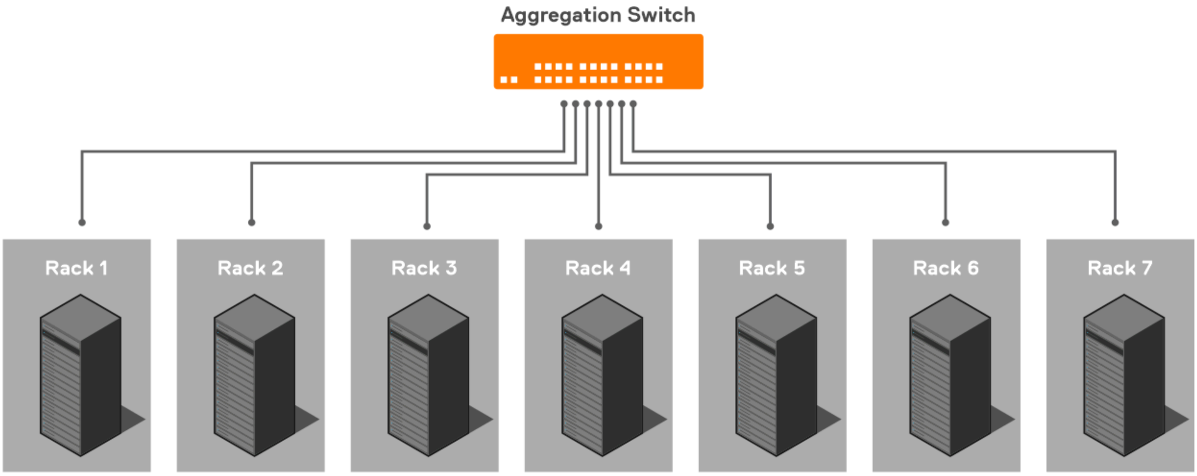

Aggregation Switch
Rack 1
Rack 2
Rack 3
Rack 4
Rack 5
Rack 6
Rack 7

Figure 76. Aggregation topology

The aggregation switches can be installed in the Dell Technologies rack or a customer provided rack. Customer must follow all the recommended power rules that are outlined in the *ECS EX900 Third-Party Rack Planning and Installation Guide*.

For installation in a Dell Technologies rack, it is recommended to take the place of node 16 and rack Eagle and Falcon in U39 and U40 respectively.

The aggregation switch allows you to connect up to seven racks of EXF900 nodes in the same cluster.

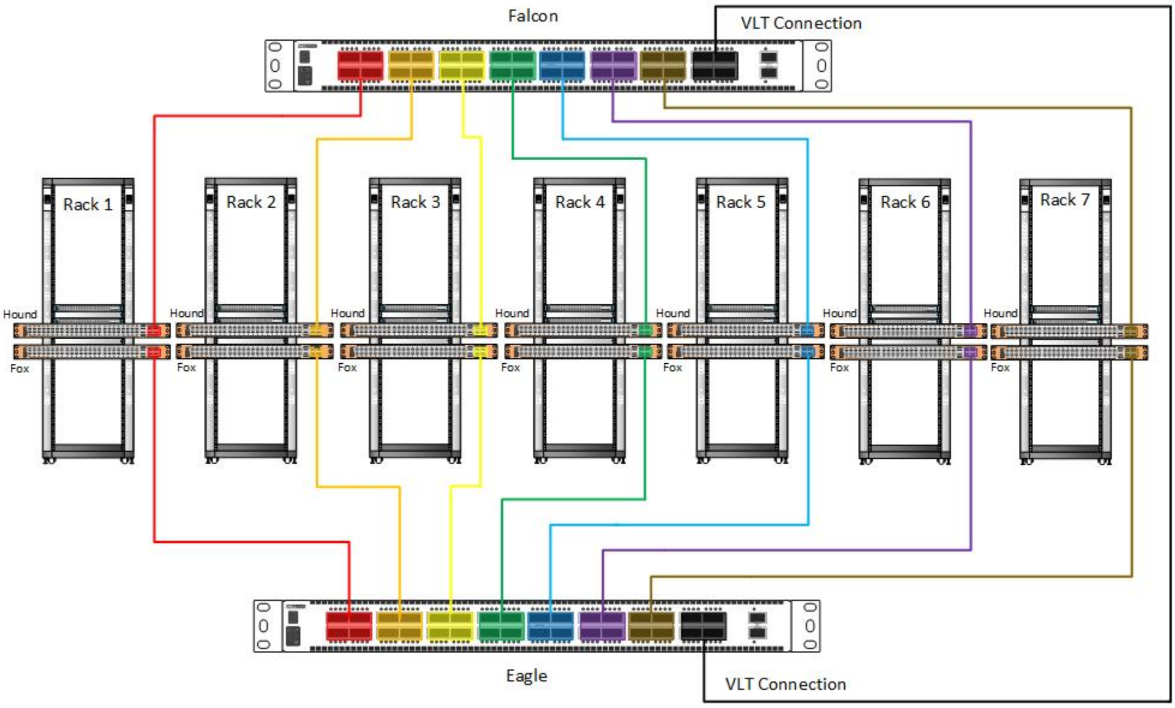

Falcon
VLT Connection
Rack 1
Rack 2
Rack 3
Rack 4
Rack 5
Rack 6
Rack 7
Hound
Fox
Eagle
VLT Connection

Figure 77. Inter-rack switch connectivity - aggregation topology

The aggregation network is expected to be connected per the following:

Table 37. Aggregation port cabling

Rack 1 Expansion	Hound	Port		Port	Falcon	Aggregation Switches
		53	<------------->	1		
		54	<------------->	2		

Table 37. Aggregation port cabling (continued)

		55	<------------->	3		
		56	<------------->	4		
	Fox	Port		Port	Eagle	
		53	<------------->	1		
		54	<------------->	2		
		55	<------------->	3		
		56	<------------->	4		
Rack 2 Expansion	Hound	Port		Port	Falcon	Aggregation Switches
		53	<------------->	5		
		54	<------------->	6		
		55	<------------->	7		
		56	<------------->	8		
	Fox	Port		Port	Eagle	
		53	<------------->	5		
		54	<------------->	6		
		55	<------------->	7		
		56	<------------->	8		
Rack 3 Expansion	Hound	Port		Port	Falcon	Aggregation Switches
		53	<------------->	9		
		54	<------------->	10		
		55	<------------->	11		
		56	<------------->	12		
	Fox	Port		Port	Eagle	
		53	<------------->	9		
		54	<------------->	10		
		55	<------------->	11		
		56	<------------->	12		
Rack 4 Expansion	Hound	Port		Port	Falcon	Aggregation Switches
		53	<------------->	13		
		54	<------------->	14		
		55	<------------->	15		
		56	<------------->	16		
	Fox	Port		Port	Eagle	
		53	<------------->	13		
		54	<------------->	14		
		55	<------------->	15		
		56	<------------->	16		
Rack 5 Expansion	Hound	Port		Port	Falcon	Aggregation Switches

Table 37. Aggregation port cabling (continued)

		53	<------------->	17		
		54	<------------->	18		
		55	<------------->	19		
		56	<------------->	20		
	Fox	Port		Port	Eagle	
		53	<------------->	17		
		54	<------------->	18		
		55	<------------->	19		
		56	<------------->	20		
Rack 6 Expansion	Hound	Port		Port	Falcon	Aggregation Switches
		53	<------------->	21		
		54	<------------->	22		
		55	<------------->	23		
		56	<------------->	24		
	Fox	Port		Port	Eagle	
		53	<------------->	21		
		54	<------------->	22		
		55	<------------->	23		
		56	<------------->	24		
Rack 7 Expansion	Hound	Port		Port	Falcon	Aggregation Switches
		53	<------------->	25		
		54	<------------->	26		
		55	<------------->	27		
		56	<------------->	28		
	Fox	Port		Port	Eagle	
		53	<------------->	25		
		54	<------------->	26		
		55	<------------->	27		
		56	<------------->	28		

5

EX500 Platform

Topics:

- EX500 Hardware Components
- EX500 configurations
- EX500 upgrade paths
- EX500 server
- EX500 disk drives
- EX500 power cabling
- EX500 iDRAC cabling
- EX500 network cabling

EX500 Hardware Components

The EX500 ECS appliance includes the following hardware components.

Table 38. EX500 hardware components

Component	Description
40U rack	Titan D racks that include: ● Gen3 0U PDUs supporting single phase, three-phase delta, and three-phase WYE ● Front and rear doors ● Racking by Dell Technologies manufacturing In addition to the Dell Technologies-racked EX500 appliance, the EX500 nodes can be installed in customer-provided racks. For more information about third-party racking requirements, see the *ECS EX500 Third-Party Rack Planning and Installation Guide*.
Back-end (BE) switches for private network connection	● Two Dell Technologies S5148F or S5248 25 GbE 1U Ethernet switches with 48 x 25 GbE SFP ports. ● Two VLT cables per HA pair.
Front-end (FE) switches for customer public network connection	● Two optional Dell Technologies S5148 or S5248 25 GbE 1U Ethernet switches can be obtained for network connection, or the customer can provide their own 10 GbE or 25 GbE HA pair for the front end. ● If the customer provides their own front-end switches, they must supply all VLT cables, SFPs, or external connection cables. ● If Dell Technologies S5248F 25 GbE front-end switches are used, the 25 GbE ports are configured to run at 25G to connect to the EX500 nodes, and 2 x 100 GbE VLT cables are provided.
Nodes	● Minimum number of nodes per rack is 1. ○ Minimum initial configuration is 5. ○ Supports spill-over expansion racks with one node. For example, a 17-node VDC has a 16-node rack and a 1-node rack. ● Hard drive sizes can be 8 TB or 12 TB, ECS 3.5 and later supports 16 TB (All drives sizes must be the same in the node) ● ECS 3.7 supports 2 TB, 4 TB, and 20 TB drive capacities. ● Within a Dell Technologies manufactured rack that is delivered from the factory, all nodes within the rack are of the exact same drive size. For node upgrades in the field, nodes with other sized drives are allowed within the rack. ● 12 (slots 12-23) or 24 (slots 00-23) SATA hard drives (HDDs) in each node. ● 480 GB M.2 (BOSS) system disk in each node.

Table 38. EX500 hardware components (continued)

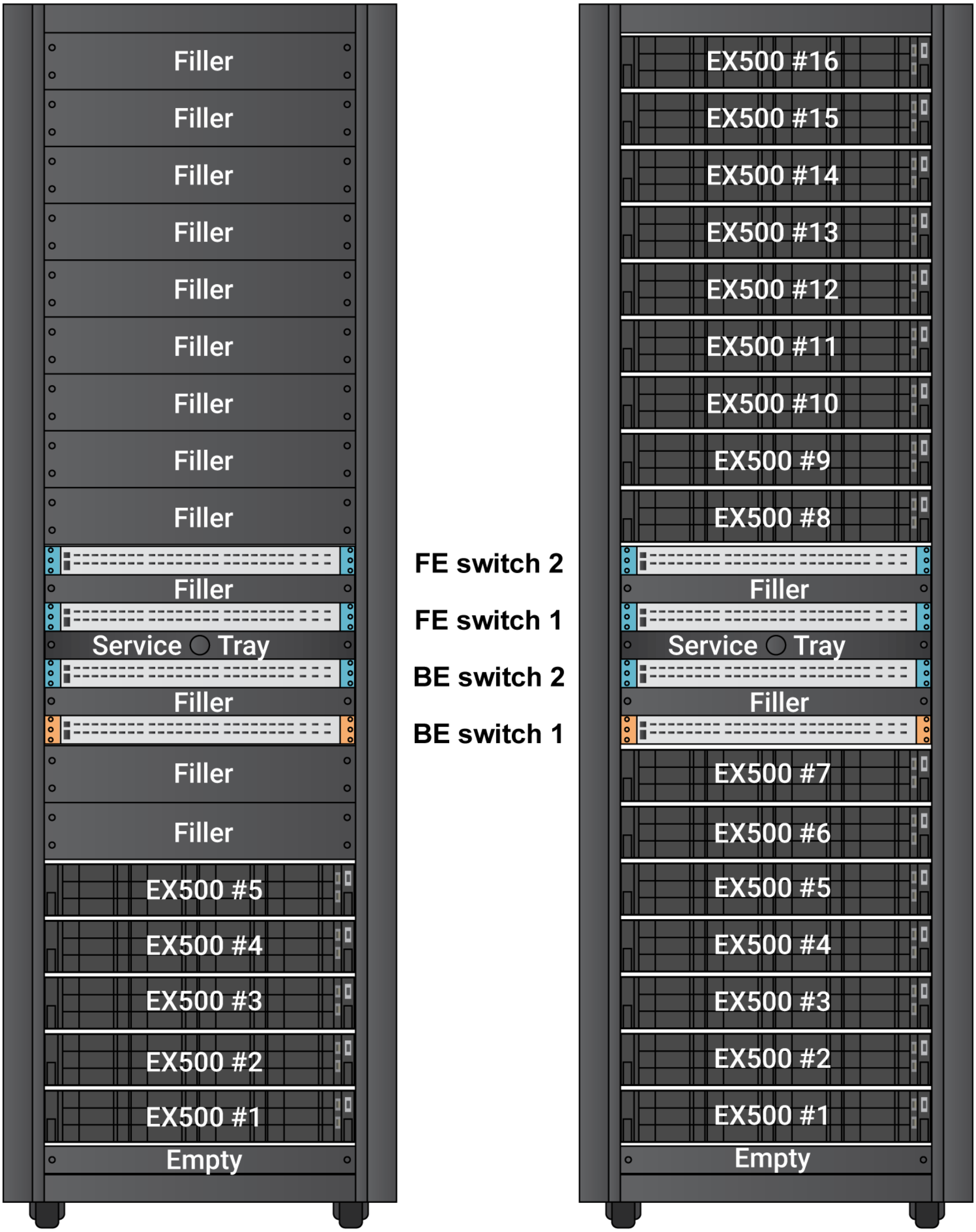
Component	Description
	● 64 GB RAM per node. ● Two 10-core Xeon Silver 85 W processors per node. ● 8 x 8 GB RDIMM = 64 GB or 12 x 16 GB RDIMM = 192 GB, 2666MT/s, Single Rank, x8 Data Width. ● Dual 1100 W Platinum power supply. ● Each node has 4 x 25 GbE networking.

EX500 configurations

Learn about the EX500 ECS appliance configurations.

The front view of an EX500 rack with the minimum node configuration and an EX500 rack with the maximum node configuration is shown in the following diagram. There area minimum of five SKUs of EX500 nodes, all have the same configuration except for their drive load and number of nodes. The back view requires a brace wherever there is empty space above or below an EX500 server. The following diagram represents the recommended racking.

Figure 78. EX500 minimum and maximum configurations


Filler
Filler
Filler
Filler
Filler
Filler
Filler
Filler
Filler
Filler
Service Tray
Filler
Filler
Filler
EX500 #5
EX500 #4
EX500 #3
EX500 #2
EX500 #1
Empty
FE switch 2
FE switch 1
BE switch 2
BE switch 1
EX500 #16
EX500 #15
EX500 #14
EX500 #13
EX500 #12
EX500 #11
EX500 #10
EX500 #9
EX500 #8
Filler
Service Tray
Filler
EX500 #7
EX500 #6
EX500 #5
EX500 #4
EX500 #3
EX500 #2
EX500 #1
Empty

Minimum Configuration **Maximum Configuration**

The EX500 appliance is available in the following configurations within a Dell EMC rack or a customer-provided rack.

EX500 supports 5 nodes in the same configuration. You can combine 2 TB, 4 TB, 8 TB, 12 TB, 16 TB, and 20 TB disks, with a minimum of 5 nodes containing the same disk configuration (size and quantity). 16 TB requires ECS 3.5 and later releases. 2 TB, 4 TB, or 20 TB requires ECS 3.7 and later.

Table 39. EX500 configurations

Nodes	Disks in each node	Disk Size	RAW Storage capacity
5 (minimum configuration)	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 120 TB • 240 TB • 480 TB • 7.20 PB • 9.60 PB • 1.2 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 240 TB • 480 TB • 960 TB • 1.44 PB • 1.92 PB • 2.4 PB
6	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 144 TB • 288 TB • 576 TB • 864 TB • 1.15 PB • 1.44 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 288 TB • 576 TB • 1.15 PB • 1.73 PB • 2.30 PB • 2.88 PB
7	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 168 TB • 336 TB • 672 TB • 1.01 PB • 1.34 PB • 1.68 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 336 TB • 672 TB • 1.34 PB • 2.02 PB • 2.69 PB • 3.36 PB
8	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 192 TB • 384 TB • 768 TB • 1.15 PB • 1.54 PB • 1.92 PB
	24	• 2TB • 4TB • 8 TB	• 384 TB • 768TB • 1.54 PB

Table 39. EX500 configurations (continued)

Nodes	Disks in each node	Disk Size	RAW Storage capacity
		12 TB 16 TB 20 TB	2.30 PB 3.07 PB 3.84 PB
9	12	2TB 4TB 8 TB 12 TB 16 TB 20 TB	216 TB 432 TB 864 TB 1.30 PB 1.72 PB 2.16 PB
	24	2TB 4TB 8 TB 12 TB 16 TB 20 TB	432 TB 864 TB 1.73 TB 2.59 PB 3.46 PB 4.32 PB
10	12	2TB 4TB 8 TB 12 TB 16 TB 20 TB	240 TB 480 TB 960 TB 1.44 PB 1.92 TB 2.44 PB
	24	2TB 4TB 8 TB 12 TB 16 TB 20 TB	480 TB 960TB 1.92 PB 2.88 PB 3.84 PB 4.80 PB
11	12	2TB 4TB 8 TB 12 TB 16 TB 20 TB	264 TB 528 TB 1.06 PB 1.58 PB 2.11 PB 2.64 PB
	24	2TB 4TB 8 TB 12 TB 16 TB 20 TB	528 TB 1.05 PB 2.11 PB 3.17 PB 4.22 PB 5.28 PB
12	12	2TB 4TB 8 TB 12 TB 16 TB 20 TB	288 TB 576 TB 1.15 PB 1.73 PB 2.30 PB 2.88 PB
	24	2TB 4TB 8 TB 12 TB	576 TB 1.15 PB 2.30 PB 3.46 PB

Table 39. EX500 configurations (continued)

Nodes	Disks in each node	Disk Size	RAW Storage capacity
		• 16 TB • 20 TB	• 4.61 PB • 5.76 PB
13	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 312 TB • 624 TB • 1.25 PB • 1.87 PB • 2.50 PB • 3.12 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 624 TB • 1.24 PB • 2.50 PB • 3.74 PB • 4.99 PB • 6.24 PB
14	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 336 TB • 672 TB • 1.34 PB • 2.02 PB • 2.69 PB • 4.03 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 672 TB • 1.34 PB • 2.69 PB • 4.03 PB • 5.38 PB • 6.72 PB
15	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 360 TB • 720 TB • 1.44 PB • 2.16 PB • 2.88 PB • 3.60 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 720 TB • 1.44 PB • 2.88 PB • 4.32 PB • 5.76 PB • 7.20 PB
16 (maximum configuration)	12	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 384 TB • 768 TB • 1.54 PB • 2.30 PB • 3.07 PB • 3.84 PB
	24	• 2TB • 4TB • 8 TB • 12 TB • 16 TB • 20 TB	• 768 TB • 1.53 PB • 3.07 PB • 4.61 PB • 6.14 PB • 7.68 PB

EX500 upgrade paths

Learn about the EX500 ECS appliance upgrade paths.

If there are five or more nodes in the system (VDC) with the same disk size and total node disk capacity, the minimum node expansion is only one. This upgrade is possible when the expansion node has the same disk size and the total disk capacity of the existing nodes. For example, you have an EX500 appliance with five nodes containing 24x8TB disks (192TB). You can add a single node with 24x8TB disks or a total disk capacity of 192TB.

If you are adding nodes that have different disk sizes or node capacity than the nodes currently in the system, you must add a minimum of five nodes at a time. For example, you have an EX500 appliance with five nodes containing 24x8TB drives. If you want to add nodes of different drive size (12TB or 16TB), you must add five or more nodes, at a time.

NOTE: All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes within a rack.

- Disk upgrade kits are available in 12-disk increments.
- EX500 upgrades: 12 to 24 disks.
- To add disk capacity to an EX500, disk upgrade kits per node must be ordered based on the existing disk capacity 8 TB, 12 TB , and16 TB.
- 2 TB, 4 TB or 20 TB disk capacity is available on ECS 3.7 and later.
- All empty drive slots must be filled with a disk filler.

Table 40. EX500 Disk Upgrade Kit

Disk Upgrade Kit	Quantity	Upgrade Result Per Server
12-disk upgrade	1	EX500 - 12 to 24 disk upgrade

EX500 server

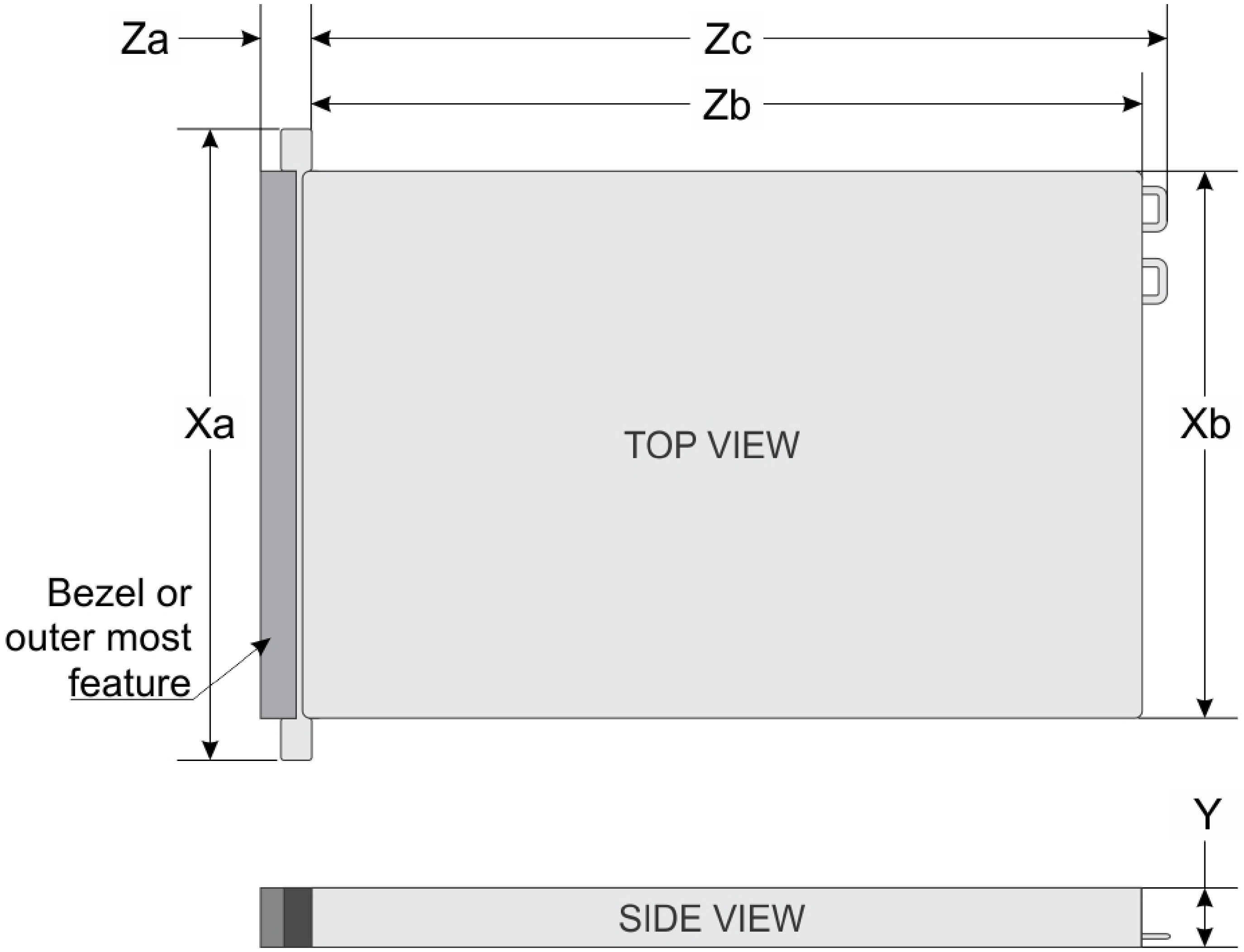
Learn about the standard features of EX500 server.

Table 41. Standard features of EX500 servers

Features	2 TB	4 TB	8 TB	12 TB	16 TB	20 TB
HDDs in front slots	2 TB 7.2k RPM 512e SATA hard drive	4 TB 7.2k RPM 512e SATA hard drive	8 TB 7.2k RPM 512e SATA hard drive	12 TB 7.2k RPM 512e SATA hard drive	16 TB 7.2k RPM 512e SATA hard drive	20 TB 7.2k RPM 512e SATA hard drive
SSD in rear slots	Optional 960 GB SATA MU SSD read cache. ● This feature is optional and available only with 3.5 and above. For more information, see *ECS Appliance SSD Read Cache Deployment guide*.					
Chassis	● EX500 24 x 3.5" two CPU chassis ● One-node server (2U) with two CPUs per node ● Maximum chassis weight is 43.2 kg (95.24 lb)					
Riser Configuration	● Each EX500 server supports up to eight PCI express (PCIe) Gen3 expansion cards that can be installed on the system board using three expansion card risers. ● Config 1 (1 B + 2 B) ● Four x8 slots and rear storage					
Processors	2x Xeon Silver 10 core/20 thread 85 W					
Memory	192 GB memory configuration with 12 x 16 GB RDIMM and 64 GB memory SKUs with 8 x 8 GB RDIMM, 2666MT/s, Single Rank, x8 Data Width					
Disk Controller	HBA330 mini (IOC, JBOD)					
PCIe Slot 1	Broadcom 57414 2x25GbE, SFP28					
PCIe Slot 2	BOSS controller card + with 1 M.2 stick 480 GB, LP					

Table 41. Standard features of EX500 servers (continued)

PCIe Slot 3	Broadcom 57414 2x25 GbE, SFP28
Management	iDRAC9 Enterprise
Power	2 x 1100 W Platinum



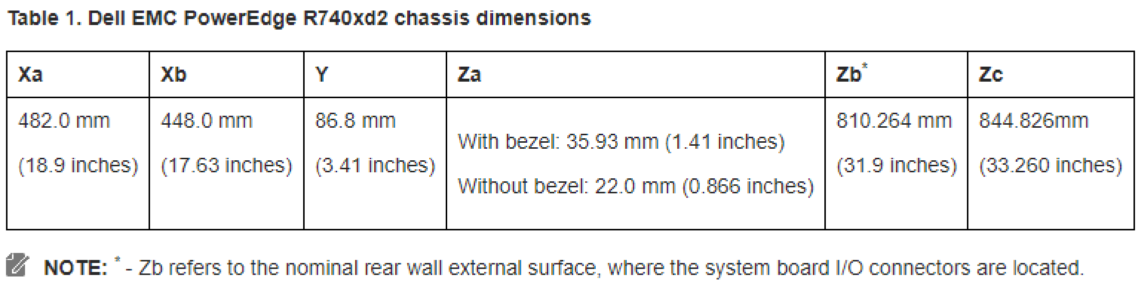


Table 1. Dell EMC PowerEdge R740xd2 chassis dimensions

Xa	Xb	Y	Za	Zb*	Zc
482.0 mm (18.9 inches)	448.0 mm (17.63 inches)	86.8 mm (3.41 inches)	With bezel: 35.93 mm (1.41 inches) Without bezel: 22.0 mm (0.866 inches)	810.264 mm (31.9 inches)	844.826mm (33.260 inches)

NOTE: * - Zb refers to the nominal rear wall external surface, where the system board I/O connectors are located.

Figure 79. EX500 server physical dimensions

Server front view

Learn about the EX500 front view.

The following figure shows the EX500 2U server chassis front with 12 x 3.5" SATA HDDs.

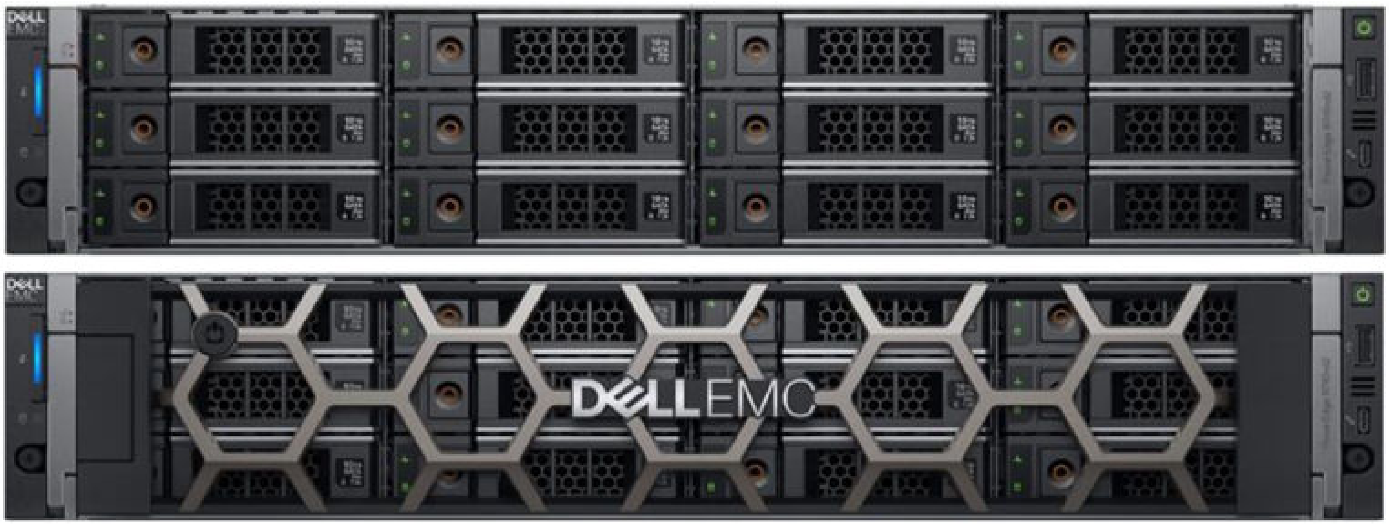


Figure 80. EX500 server chassis front view

LED indicators are on the left and right side of the server front panels.

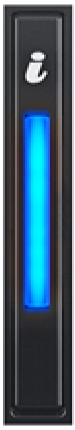


Figure 81. Left control panel

The left control panel LED behavior is broken into two subsets, the light bar and the status LEDs. The light bar also functions as a button. The light bar indicates chassis health and also functions as System ID when pressed.

Table 42. Decoding of LEDs in light bar

Status	ID button
Indicates that the system is turned on, system is healthy, and system ID mode is not active. Press the system health and system ID button to switch to system ID mode.	Solid Blue
Indicates that the system is in fail-safe mode. If the problem persists, see the Getting help section.	Solid Amber
Indicates that the system is experiencing a fault. Check the System event log for specific error messages. For information about the event and error messages generated by the system firmware and agents that monitor system components, see the Error Code Lookup page at qrl.dell.com	Blink Amber
Indicates that the system ID mode is active. Press the system health and system ID button to switch to system health mode.	Blink Blue

There are two status LEDs to indicate and identify any failed hardware components.

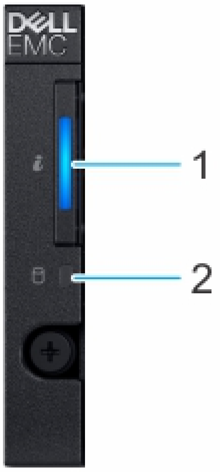


Figure 82. Status LEDs decoded view

1. System health and system ID indicator

2. Drive indicator

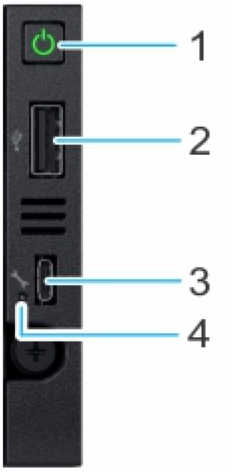


Figure 83. Right control panel

1. Power button
2. USB 2.0-compliant port
3. Micro-USB for iDRAC Direct
4. iDRAC LED indicator

Server back view

Learn about the EX500 back view.

The EX500 server chassis provides dual hot-swappable power supplies with 1 + 1 redundancy, autosensing and autoswitching capability.

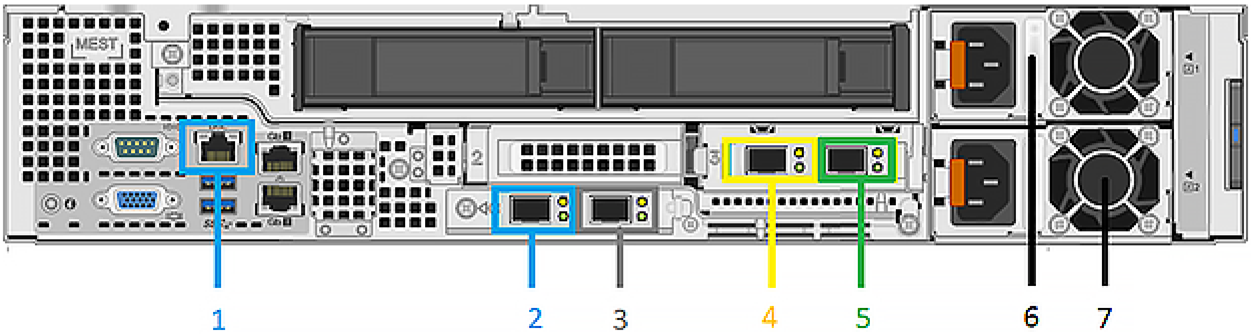


Figure 84. EX500 server chassis back view

In the table below, *x* is the server number.

Network Cable Description	Labeling
1 - iDRAC management port, back-end switch 1	Server *x* iDRAC *
2 - Backend switch 1	Server *x* BE 1 *
3 - Backend switch 2	Server *x* BE 2 *
4 - Frontend switch 2	Server *x* FE 2 *
5 - Frontend switch 1	Server *x* FE 1 *
6 - Power cable (black)	AC PS1
7 - Power cable (gray)	AC PS2

EX500 disk drives

Learn about the disk drives that are integrated into the server chassis of the EX500 appliance.

EX500 nodes contain 24 3.5 in. SATA front-accessible, hot-swappable drives in disk bay 1, slots 0-11, and disk bay 2, slots 12-23. Disk size can be 2 TB, 4 TB, 8 TB, 12 TB, 16 TB, or 20 TB. All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes and quantities (12 or 24) within a rack. In PCIe slot 2 of each node, there is a 480 GB Boot Optimized Storage Subsystem (BOSS) controller card with one M.2 stick.

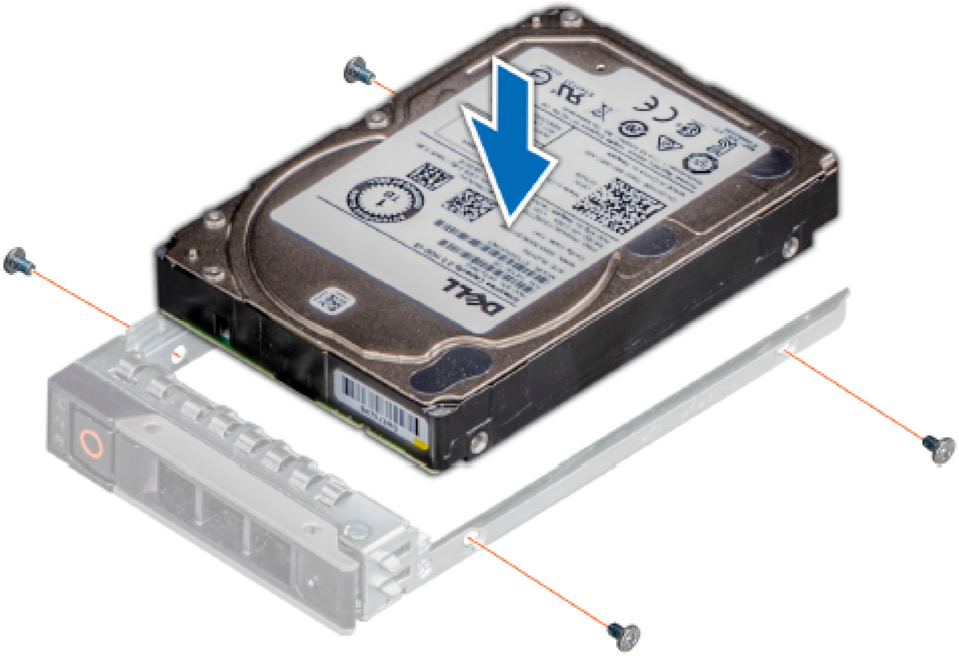


Figure 85. EX500 disk drive in carrier

EX500 power cabling

Review the EX500 ECS appliance cabling diagrams for single-phase AC power and three-phase delta and WYE AC power.

Use the power and weight calculator to refine the power and heat values to more-closely match the hardware configuration for your system. The calculator contains the latest information for power and weight planning.

The EX500 appliance connections to 0U PDU and 2U PDU outlets are listed in the following tables.

Table 43. EX500 0U PDU single-phase zone A/B mapping

PDU outlet	Branch	Component	Line cord per zone
37	12	Empty	3
36	12	Empty	3
35	12	Empty	3
34	12	Empty	3
33	11	Node 16	3
32	11	Node 15	3
31	11	Node 14	3
30	10	Empty	2
29	10	Empty	2
28	10	Empty	2

Table 43. EX500 0U PDU single-phase zone A/B mapping (continued)

PDU outlet	Branch	Component	Line cord per zone
27	9	Empty	2
26	9	Empty	2
25	9	Node 13	2
24	8	Node 12	2
23	8	Node 11	2
22	8	Node 10	2
21	7	Node 9	2
20	7	Node 8	2
19	7	Node 7	2
18	6	Empty	1
17	6	Empty	1
16	6	Empty	1
15	5	Empty	1
14	5	Empty	1
13	5	Empty	1
12	4	FE Switch 2	1
11	4	FE Switch 1	1
10	4	Tray/Light Bar	1
9	3	BE Switch 2	1
8	3	BE Switch 1	1
7	3	Empty	1
6	2	Node 6	1
5	2	Node 5	1
4	2	Node 4	1
3	1	Node 3	1
2	1	Node 2	1
1	1	Node 1	1

Table 44. EX500 PDU three-phase Delta and WYE zone A/B mapping

PDU outlet	Branch	Component	Line cord per zone
37	12	Empty	1
36	12	Empty	1
35	12	Empty	1
34	12	Empty	1
33	11	Empty	1
32	11	Empty	1
31	11	Empty	1
30	10	Empty	1

Table 44. EX500 PDU three-phase Delta and WYE zone A/B mapping (continued)

PDU outlet	Branch	Component	Line cord per zone
29	10	Empty	1
28	10	Empty	1
27	9	Empty	1
26	9	Empty	1
25	9	Empty	1
24	8	Empty	1
23	8	Empty	1
22	8	Empty	1
21	7	Node 16	1
20	7	Node 15	1
19	7	Node 14	1
18	6	Node 13	1
17	6	Node 12	1
16	6	Node 11	1
15	5	Node 10	1
14	5	Node 9	1
13	5	Node 8	1
12	4	FE Switch2	1
11	4	FE Switch 1	1
10	4	Tray/Light Bar	1
9	3	BE Switch 2	1
8	3	BE Switch 1	1
7	3	Node 7	1
6	2	Node 6	1
5	2	Node 5	1
4	2	Node 4	1
3	1	Node 3	1
2	1	Node 2	1
1	1	Node 1	1

Table 45. EX500 2U PDU single-phase zone A/B mapping

PDU outlet	Branch	Component	Line cord per zone
24	6	Empty	3
23	6	Empty	3
22	6	Empty	3
21	6	Node 16	3
20	5	Node 11	2
19	5	Node 10	2

Table 45. EX500 2U PDU single-phase zone A/B mapping (continued)

PDU outlet	Branch	Component	Line cord per zone
18	5	Node 9	2
17	5	Node 8	2
16	4	Node 4	1
15	4	Node 3	1
14	4	FE Switch2	1
13	4	FE Switch 1	1
12	3	Node 15	3
11	3	Node 14	3
10	3	Node 13	3
9	3	Node 12	3
8	2	Tray/Light Bar	2
7	2	Node 7	2
6	2	Node 6	2
5	2	Node 5	2
4	1	Node 2	1
3	1	Node 1	1
2	1	BE Switch 2	1
1	1	BE Switch 1	1

Table 46. EX500 2U PDU three-phase Delta and WYE zone A/B mapping

PDU outlet	Branch	Component	Line cord per zone
24	6	Empty	1
23	6	Empty	1
22	6	Empty	1
21	6	Node 16	1
20	5	Node 11	1
19	5	Node 10	1
18	5	Node 9	1
17	5	Node 8	1
16	4	Node 4	1
15	4	Node 3	1
14	4	FE Switch2	1
13	4	FE Switch 1	1
12	3	Node 15	1
11	3	Node 14	1
10	3	Node 13	1
9	3	Node 12	1
8	2	Tray/Light Bar	1

Table 46. EX500 2U PDU three-phase Delta and WYE zone A/B mapping (continued)

PDU outlet	Branch	Component	Line cord per zone
7	2	Node 7	1
6	2	Node 6	1
5	2	Node 5	1
4	1	Node 2	1
3	1	Node 1	1
2	1	BE Switch 2	1
1	1	BE Switch 1	1

In the following diagrams, the switches plug into the front of the rack and route through the rails to the rear.

Figure 86. EX500 Single Phase AC Cabling Diagram

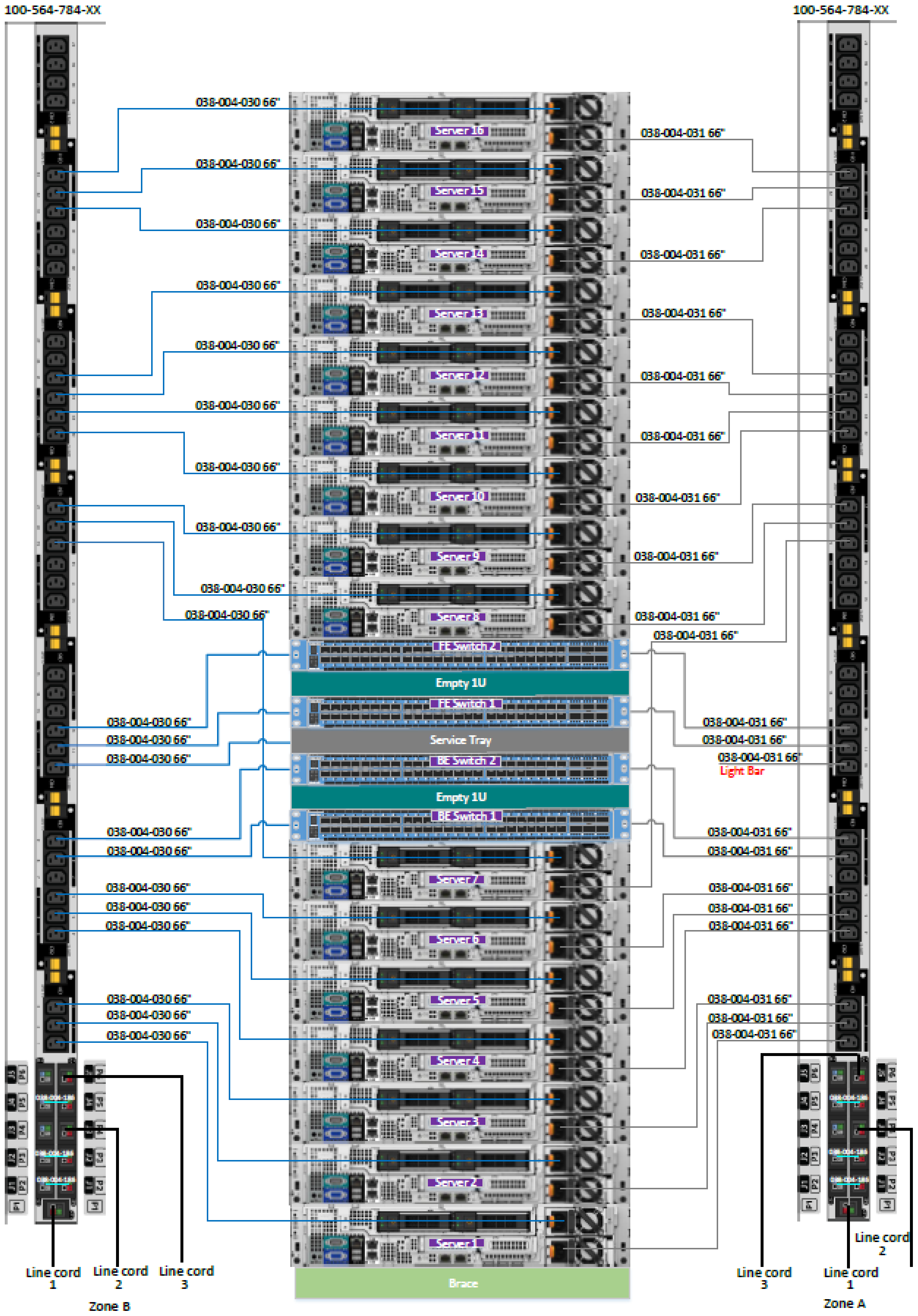
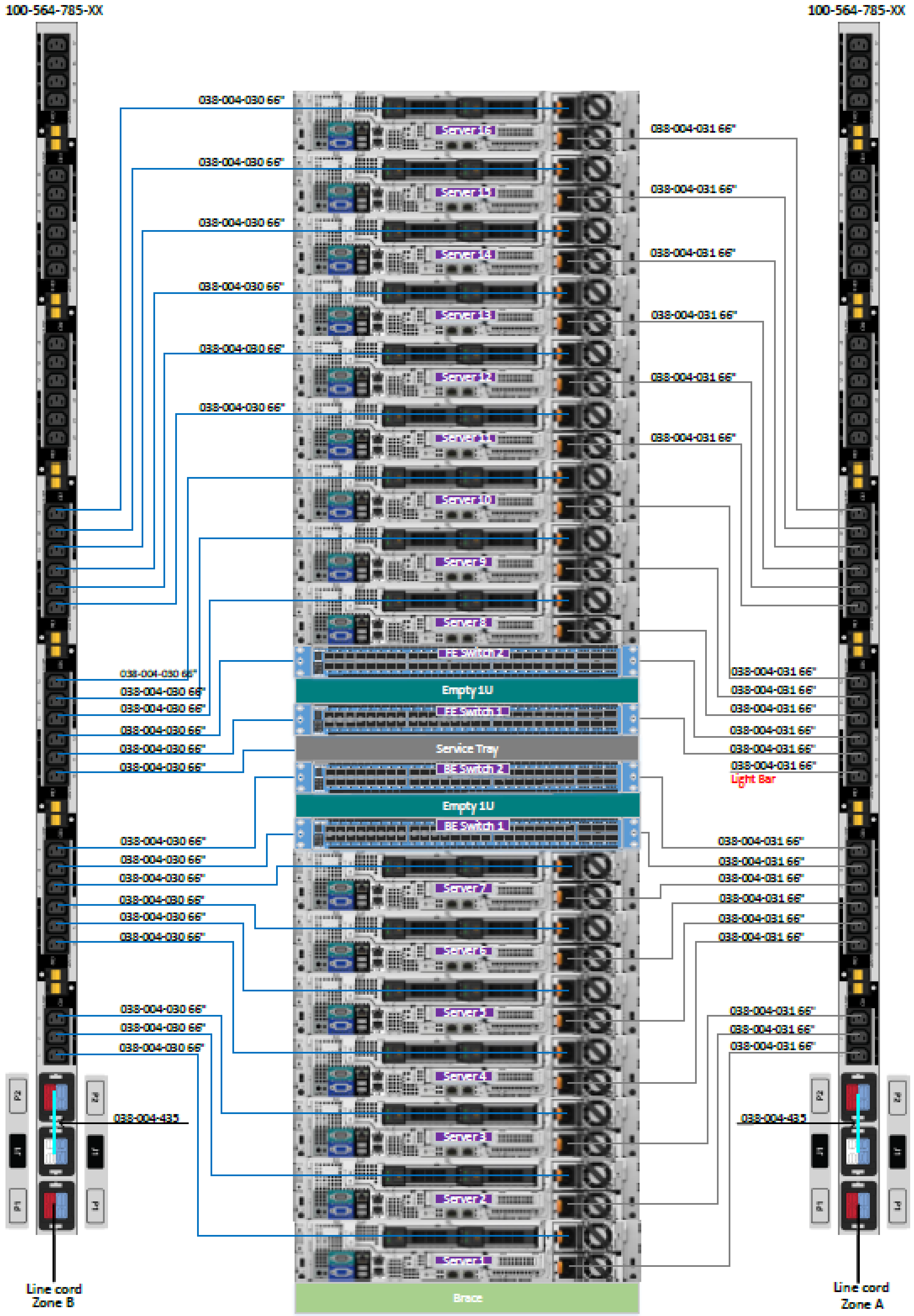

100-564-784-XX
100-564-784-XX
038-004-030 66"
Server 16
038-004-031 66"
038-004-030 66"
Server 15
038-004-031 66"
038-004-030 66"
Server 14
038-004-031 66"
038-004-030 66"
Server 13
038-004-031 66"
038-004-030 66"
Server 12
038-004-031 66"
038-004-030 66"
Server 11
038-004-031 66"
038-004-030 66"
Server 10
038-004-031 66"
038-004-030 66"
Server 9
038-004-031 66"
038-004-030 66"
038-004-030 66"
Server 8
038-004-031 66"
038-004-031 66"
FE Switch 2
Empty 1U
038-004-030 66"
038-004-030 66"
038-004-030 66"
FE Switch 1
Service Tray
BE Switch 2
038-004-031 66"
038-004-031 66"
038-004-031 66"
Light Bar
Empty 1U
BE Switch 1
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
Server 7
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Server 6
Server 5
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Server 4
Server 3
Server 2
Server 1
Brace
Line cord 1
Line cord 2
Line cord 3
Zone B
Line cord 2
Line cord 3
Line cord 1
Zone A

Figure 87. EX500 Three Phase Delta AC Cabling Diagram


100-564-785-XX
100-564-785-XX
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Light Bar
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-435
038-004-435
P2
J1
P1
P2
J1
P1
P2
J1
P1
P2
J1
P1
Line cord
Zone B
Line cord
Zone A

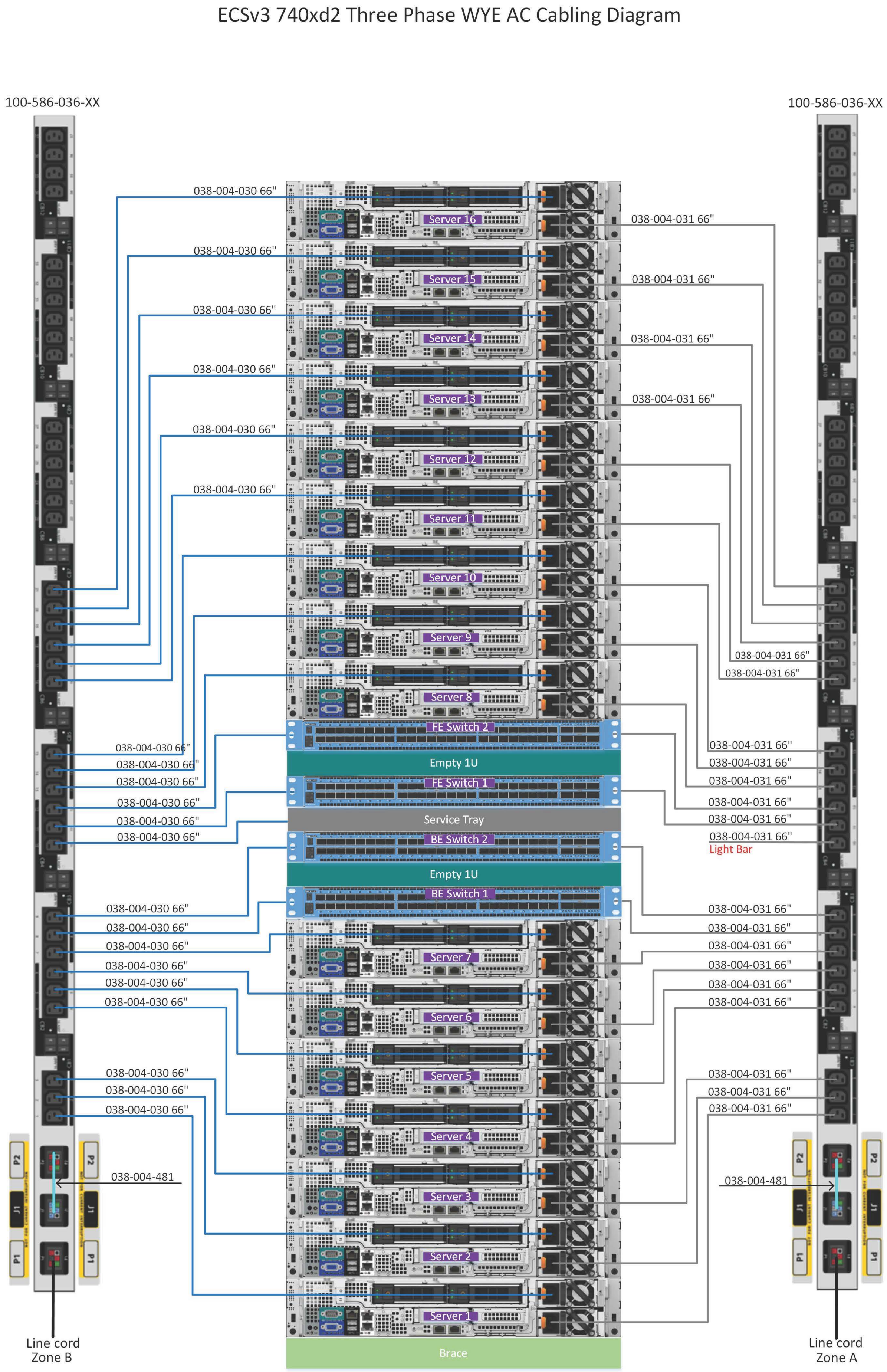

ECSv3 740xd2 Three Phase WYE AC Cabling Diagram
100-586-036-XX
100-586-036-XX
038-004-030 66"
038-004-031 66"
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
Light Bar
038-004-481
038-004-481
P2
J1
P1
Line cord Zone B
Line cord Zone A

Figure 88. EX500 Three Phase WYE AC Cabling Diagram

EX500 iDRAC cabling

Review the wiring diagrams for the iDRAC cables that connect the iDRAC port on the node to the Fox back-end switch.

The Fox switch (BE1) port numbers used for connecting to the iDRAC ports on the EX500 nodes are shown in the following diagram.

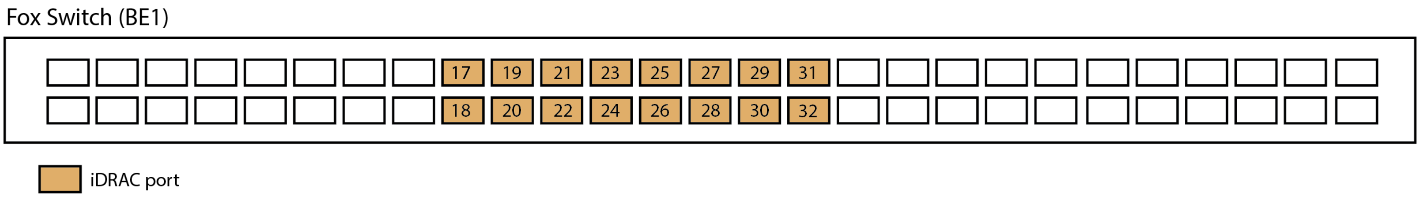


Figure 89. Fox switch iDRAC ports

Table 47. EX500 node iDRAC port to BE1 port mapping

Node 1 iDRAC port	BE1 Port 17
Node 2 iDRAC port	BE1 Port 18
Node 3 iDRAC port	BE1 Port 19
Node 4 iDRAC port	BE1 Port 20
Node 5 iDRAC port	BE1 Port 21
Node 6 iDRAC port	BE1 Port 22
Node 7 iDRAC port	BE1 Port 23
Node 8 iDRAC port	BE1 Port 24
Node 9 iDRAC port	BE1 Port 25
Node 10 iDRAC port	BE1 Port 26
Node 11 iDRAC port	BE1 Port 27
Node 12 iDRAC port	BE1 Port 28
Node 13 iDRAC port	BE1 Port 29
Node 14 iDRAC port	BE1 Port 30
Node 15 iDRAC port	BE1 Port 31
Node 16 iDRAC port	BE1 Port 32

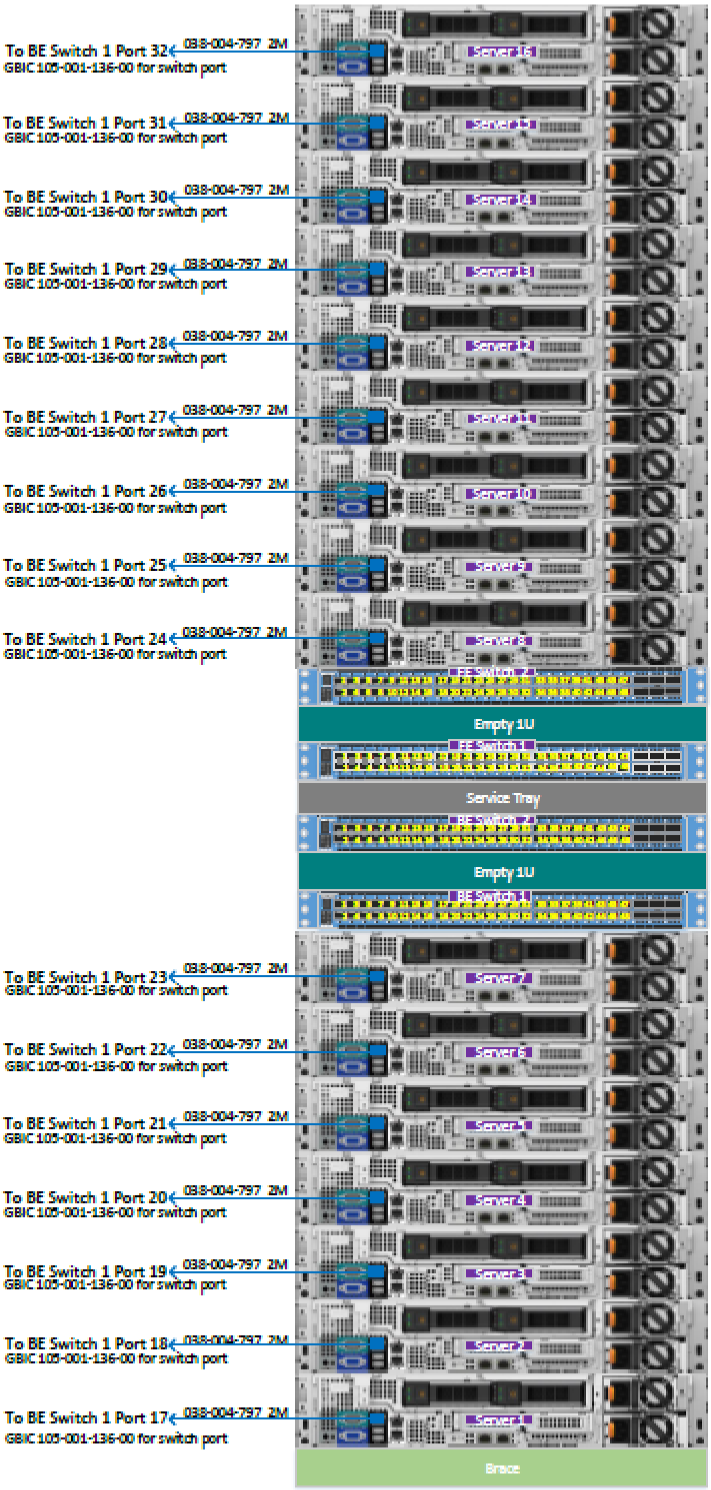

To BE Switch 1 Port 32
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 16
To BE Switch 1 Port 31
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 15
To BE Switch 1 Port 30
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 14
To BE Switch 1 Port 29
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 13
To BE Switch 1 Port 28
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 12
To BE Switch 1 Port 27
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 11
To BE Switch 1 Port 26
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 10
To BE Switch 1 Port 25
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 9
To BE Switch 1 Port 24
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 8
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
To BE Switch 1 Port 23
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 7
To BE Switch 1 Port 22
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 6
To BE Switch 1 Port 21
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 5
To BE Switch 1 Port 20
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 4
To BE Switch 1 Port 19
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 3
To BE Switch 1 Port 18
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 2
To BE Switch 1 Port 17
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 1
Brace

Figure 90. iDRAC cabling

EX500 network cabling

The network cabling diagrams apply to the EX500 appliance in a Dell Technologies or customer-provided rack.

Customers connect to an EX500 appliance by way of 25 GbE ports on the front-end switches. For an EX500 appliance, the 25GbE ports run at 25GbE. Customer configurations can include 25 GbE front-end switches provided by Dell Technologies or customers may provide their own front-end switches.

To distinguish between the two front-end switches and the two backend switches, each switch has a nickname for S5148F:

- Hare: The top S5148F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to EX500 nodes. It is located above the Rabbit switch in U22 of the EX500 rack.
- Rabbit: The bottom S5148F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to EX500 nodes. It is located below the Hare switch in U20 of the EX500 rack.
- Hound: The top S5148F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the nodes. It is located above the Fox switch in U18 of the EX500 rack.
- Fox: The bottom S5148F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the nodes. It is located below the Hound switch in U16 of the EX500 rack.

To distinguish between the two front-end switches and the two backend switches, each switch has a nickname for S5248F:

- Hare: The top S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX500 nodes.
- Rabbit: The bottom S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX500 nodes.
- Hound: The top S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX500 nodes.
- Fox: The bottom S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX500 nodes.

The front-end switch and back-end switch connections to an EX500 node are shown in the following diagram.

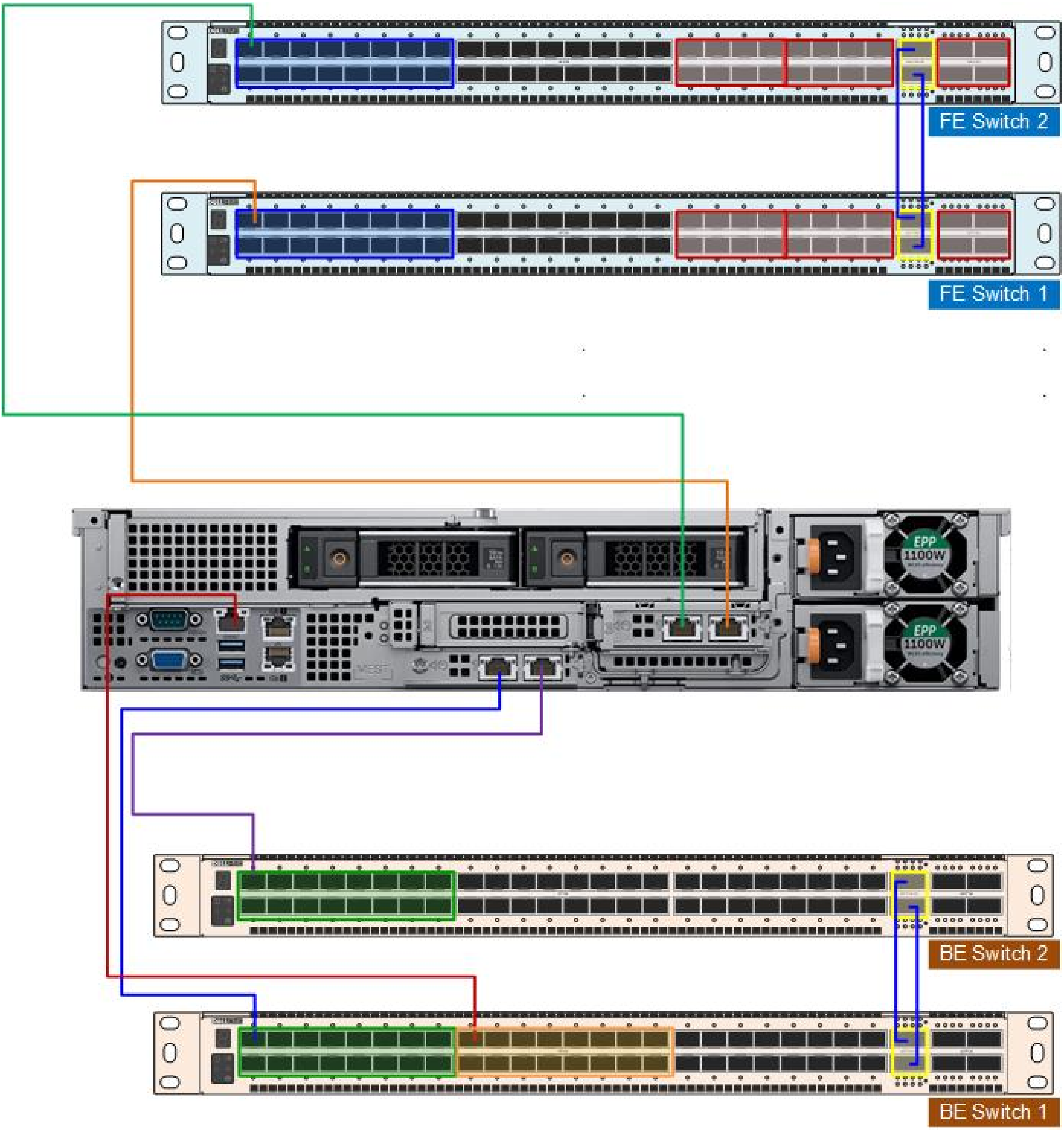
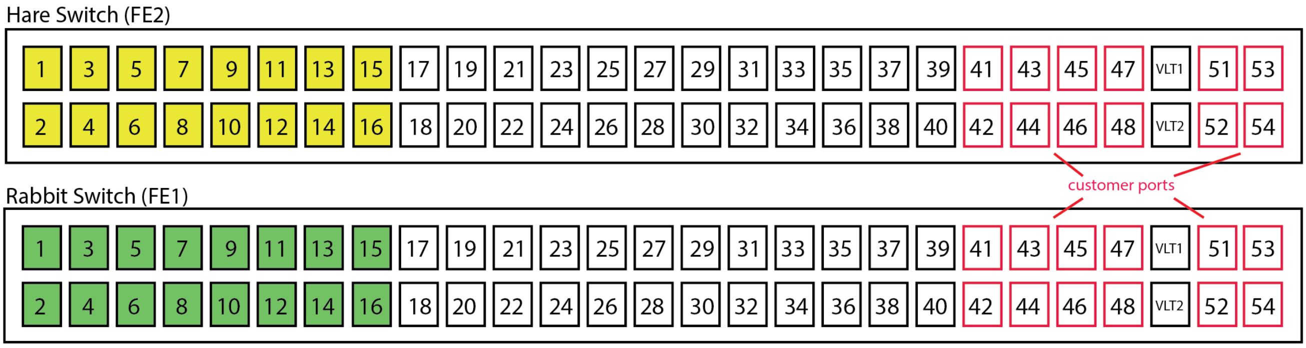


Figure 91. Frontend and backend switch connections to an EX500 node

NOTE: The connections to the Fox switch are incorrect. The iDRAC connection to the Fox switch should connect to ports 17-32, NIC Port 1 should connect to ports 1-16.

The numbered front-end switch ports used for connecting to the ports on the EX500 nodes are shown in the following diagram. Port 1 on the Hare switch (FE2) connects to port 4 on Node 1. Port 2 on the Hare switch (FE2) connects to port 4 on Node 2, and so on. Similarly, Port 1 on the Rabbit switch (FE1) connects to port 3 on Node 1. Port 2 on the Rabbit switch (FE1) connects to port 3 on Node 2, and so on.



Hare Switch (FE2)

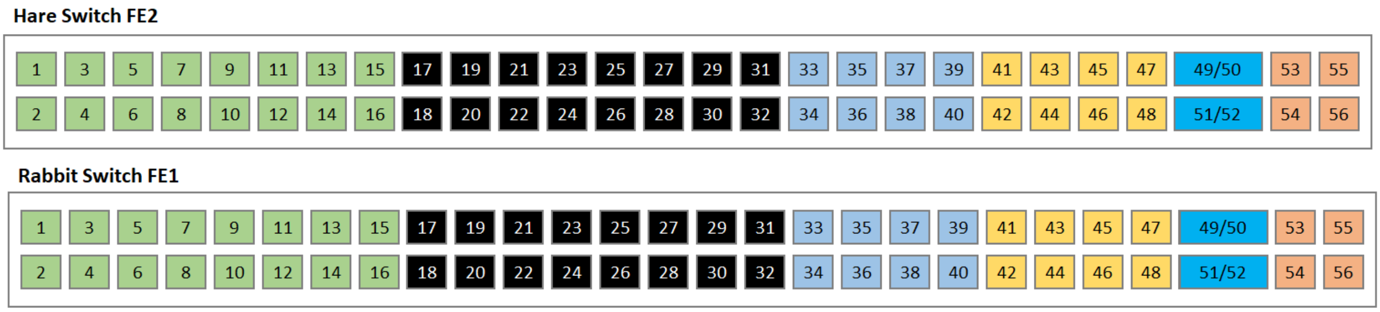
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

customer ports

Rabbit Switch (FE1)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Figure 92. Node ports on frontend S5148F switches



Hare Switch FE2

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Rabbit Switch FE1

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Figure 93. Node ports on frontend S5248F switches

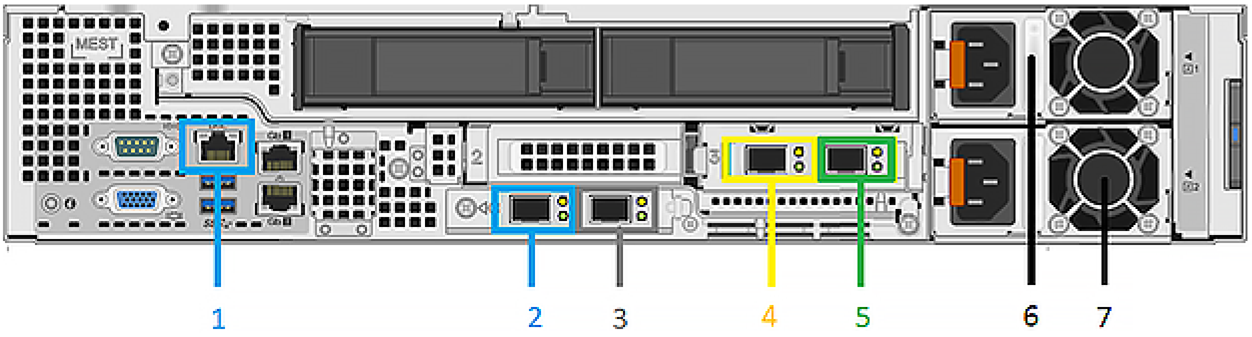


Figure 94. Network cable and labeling

In the table below, *x* is the server number.

Network Cable Description	Labeling
1 - iDRAC management port, back-end switch 1	Server *x* iDRAC *
2 - Backend switch 1	Server *x* BE 1 *
3 - Backend switch 2	Server *x* BE 2 *
4 - Frontend switch 2	Server *x* FE 2 *
5 - Frontend switch 1	Server *x* FE 1 *
6 - Power cable (black)	AC PS1
7 - Power cable (gray)	AC PS2

The numbered backend switch ports used for connecting to the ports on the EX500 nodes are shown in the following diagram. Port 1 on the Hound switch (BE2) connects to port 2 on Node 1. Port 2 on the Hound switch (BE2) connects to port 2 on Node

2, and so on. Similarly, Port 1 on the Fox switch (BE1) connects to port 1 on Node 1. Port 2 on the Fox switch (BE1) connects to port 1 on Node 2, and so on.

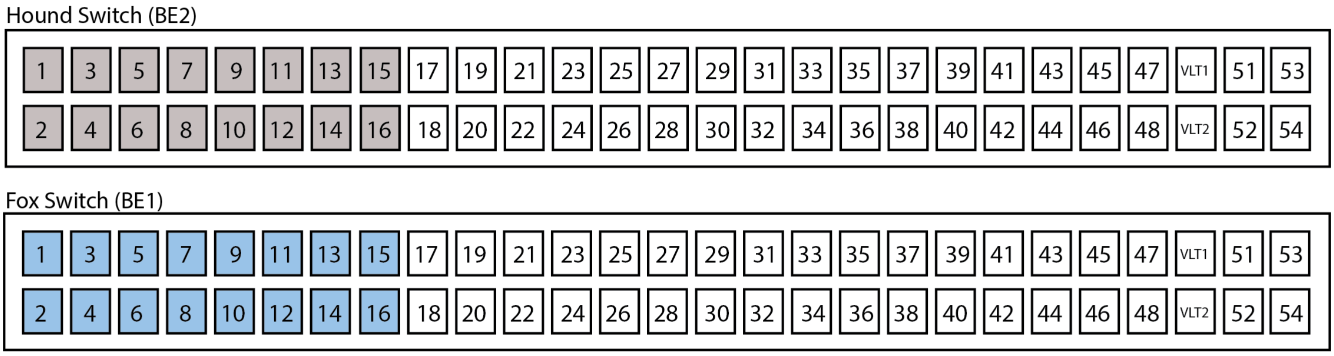

Hound Switch (BE2)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 VLT1 51 53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 VLT2 52 54
Fox Switch (BE1)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 VLT1 51 53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 VLT2 52 54

Figure 95. Node ports on backend S5148F switches

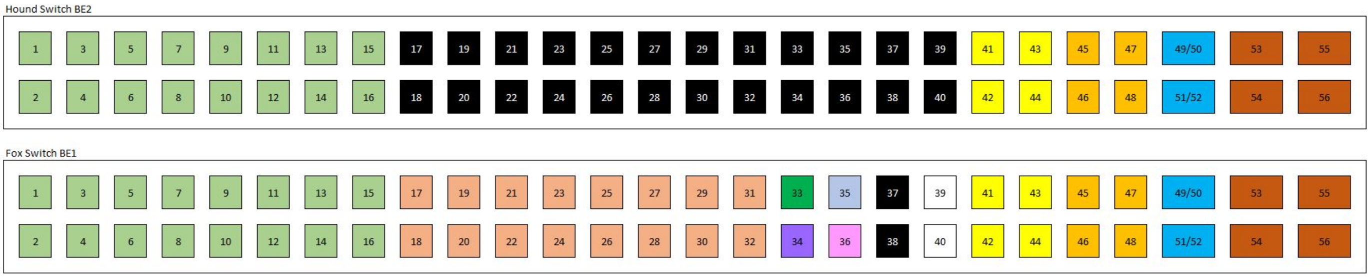
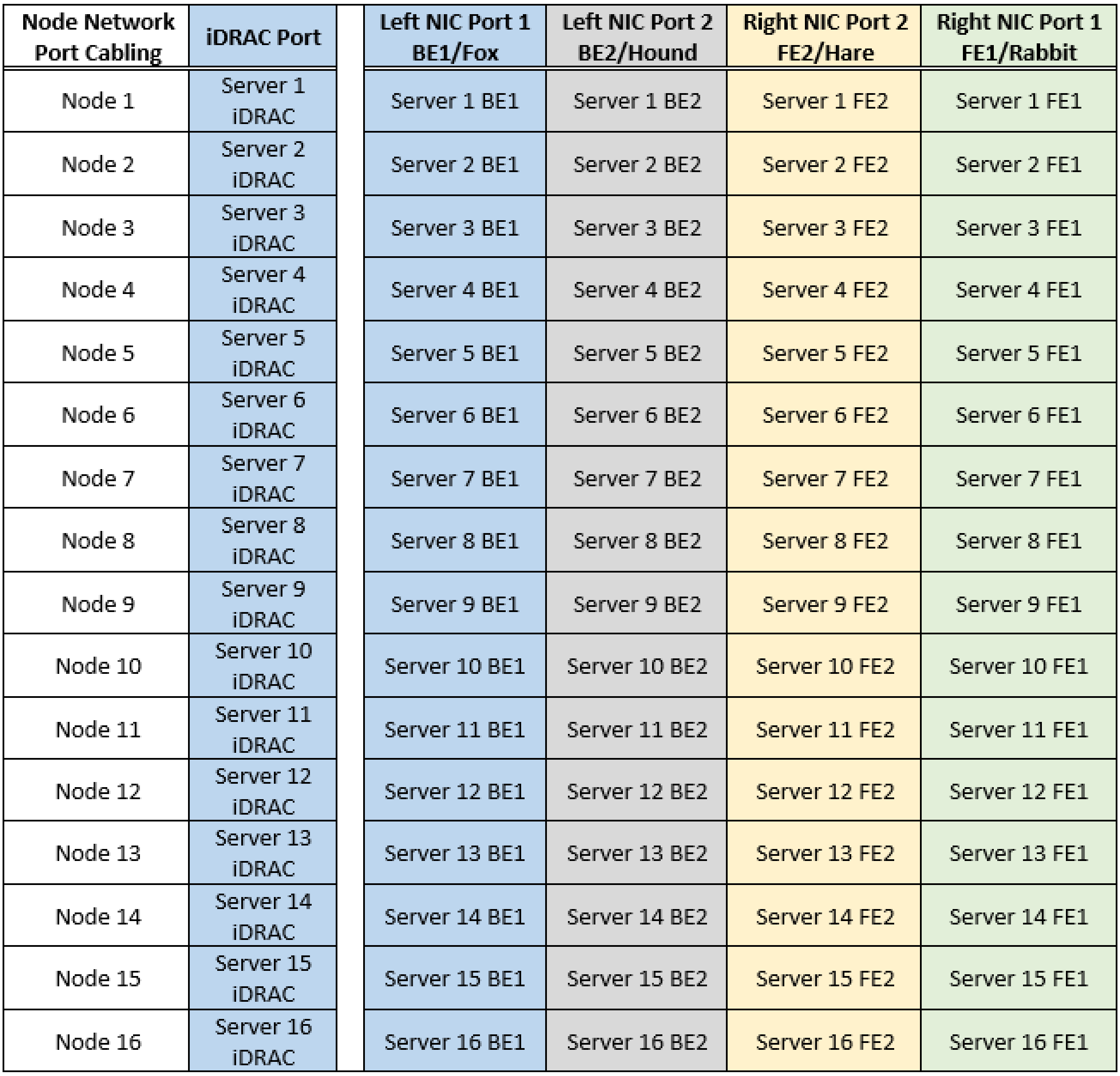

Hound Switch BE2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56
Fox Switch BE1
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56

Figure 96. Node ports on backend S5248F switches

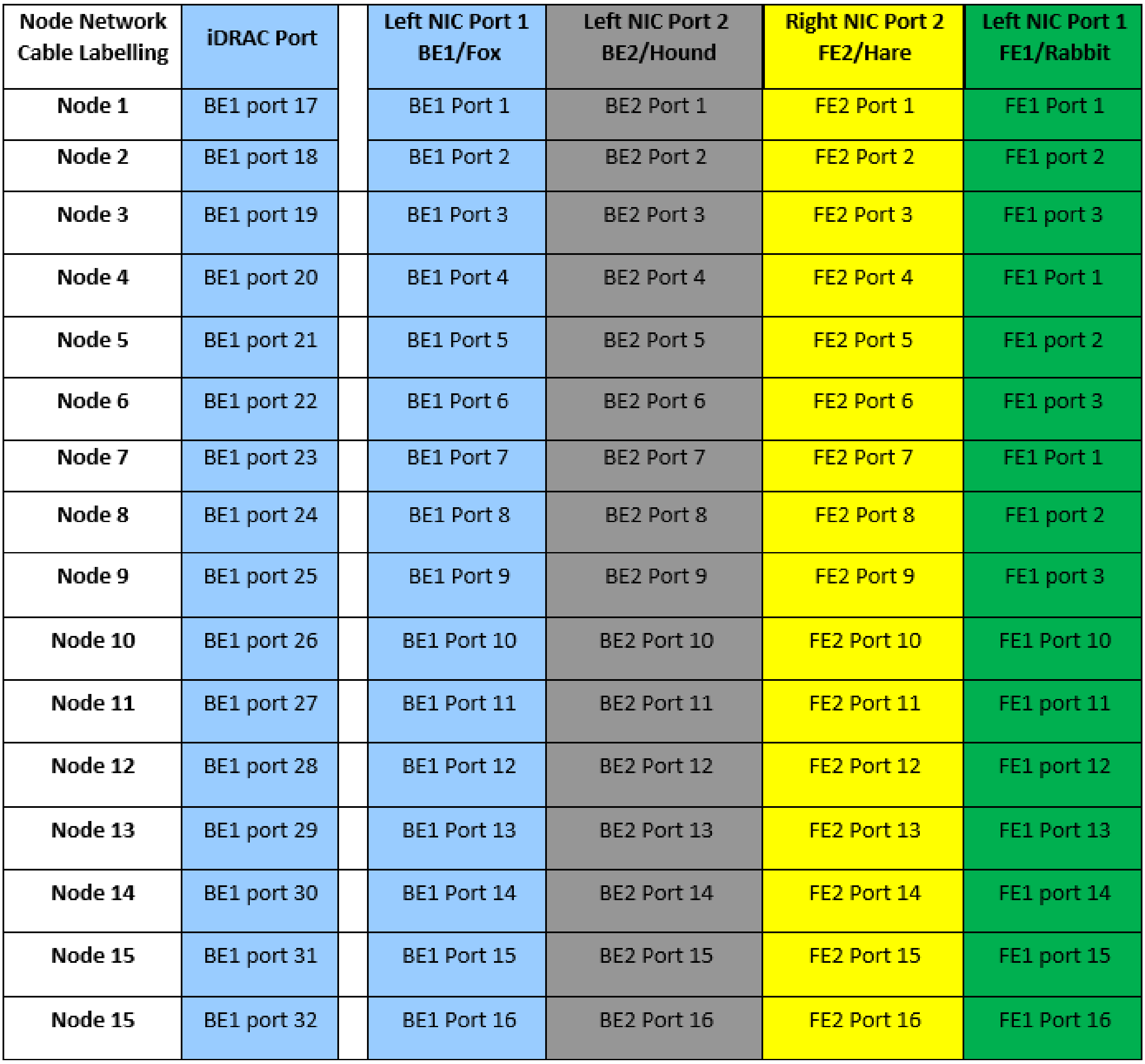
The EX500 node port to the iDRAC, back-end switch, and front-end switch port connections are listed in the following table.

Figure 97. EX500 node network port cabling connections



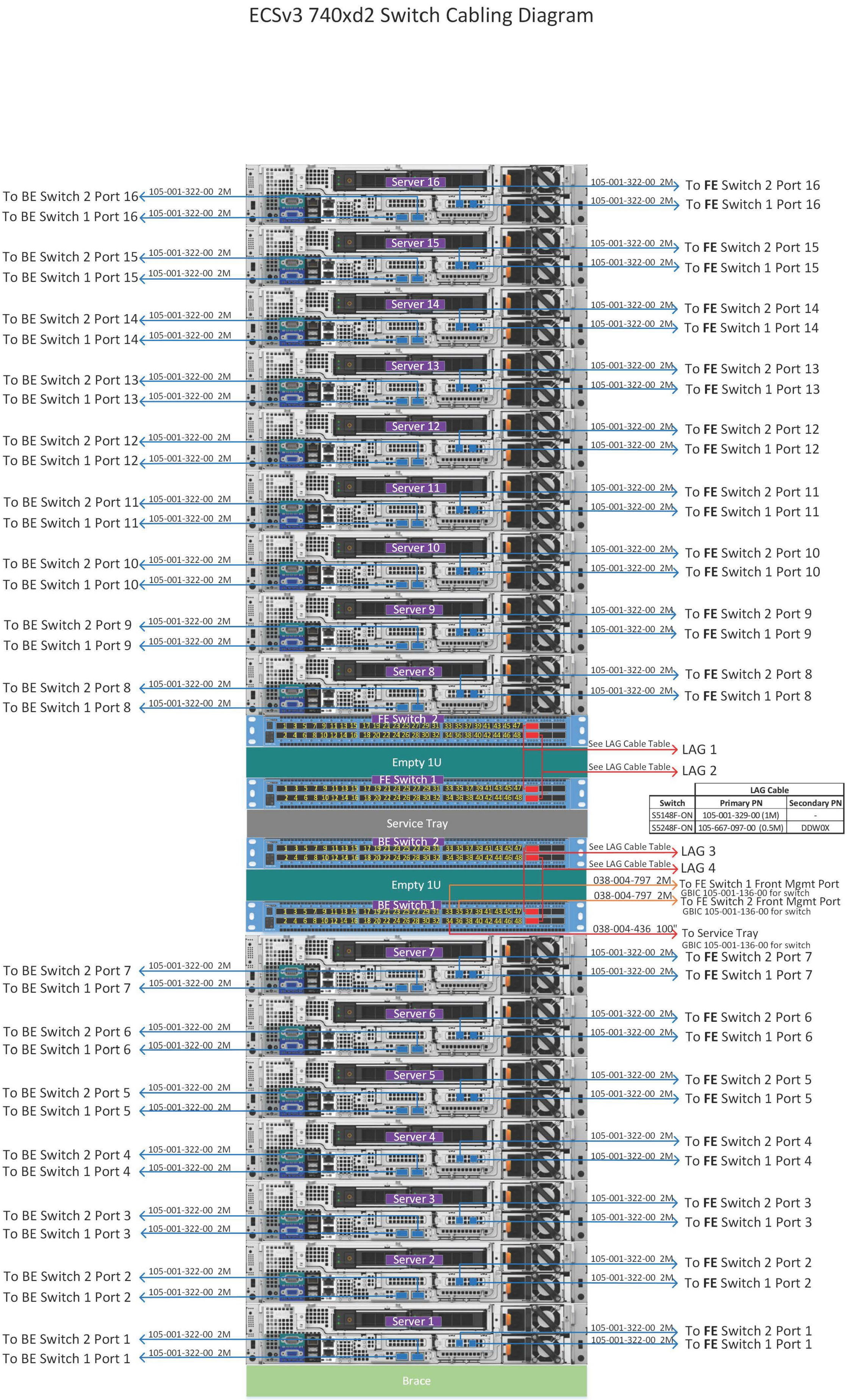
Node Network Port Cabling	iDRAC Port	Left NIC Port 1 BE1/Fox	Left NIC Port 2 BE2/Hound	Right NIC Port 2 FE2/Hare	Right NIC Port 1 FE1/Rabbit
Node 1	Server 1 iDRAC	Server 1 BE1	Server 1 BE2	Server 1 FE2	Server 1 FE1
Node 2	Server 2 iDRAC	Server 2 BE1	Server 2 BE2	Server 2 FE2	Server 2 FE1
Node 3	Server 3 iDRAC	Server 3 BE1	Server 3 BE2	Server 3 FE2	Server 3 FE1
Node 4	Server 4 iDRAC	Server 4 BE1	Server 4 BE2	Server 4 FE2	Server 4 FE1
Node 5	Server 5 iDRAC	Server 5 BE1	Server 5 BE2	Server 5 FE2	Server 5 FE1
Node 6	Server 6 iDRAC	Server 6 BE1	Server 6 BE2	Server 6 FE2	Server 6 FE1
Node 7	Server 7 iDRAC	Server 7 BE1	Server 7 BE2	Server 7 FE2	Server 7 FE1
Node 8	Server 8 iDRAC	Server 8 BE1	Server 8 BE2	Server 8 FE2	Server 8 FE1
Node 9	Server 9 iDRAC	Server 9 BE1	Server 9 BE2	Server 9 FE2	Server 9 FE1
Node 10	Server 10 iDRAC	Server 10 BE1	Server 10 BE2	Server 10 FE2	Server 10 FE1
Node 11	Server 11 iDRAC	Server 11 BE1	Server 11 BE2	Server 11 FE2	Server 11 FE1
Node 12	Server 12 iDRAC	Server 12 BE1	Server 12 BE2	Server 12 FE2	Server 12 FE1
Node 13	Server 13 iDRAC	Server 13 BE1	Server 13 BE2	Server 13 FE2	Server 13 FE1
Node 14	Server 14 iDRAC	Server 14 BE1	Server 14 BE2	Server 14 FE2	Server 14 FE1
Node 15	Server 15 iDRAC	Server 15 BE1	Server 15 BE2	Server 15 FE2	Server 15 FE1
Node 16	Server 16 iDRAC	Server 16 BE1	Server 16 BE2	Server 16 FE2	Server 16 FE1

The EX500 node network cable labeling is listed in the following table.



Node Network Cable Labelling	iDRAC Port		Left NIC Port 1 BE1/Fox	Left NIC Port 2 BE2/Hound	Right NIC Port 2 FE2/Hare	Left NIC Port 1 FE1/Rabbit
Node 1	BE1 port 17		BE1 Port 1	BE2 Port 1	FE2 Port 1	FE1 Port 1
Node 2	BE1 port 18		BE1 Port 2	BE2 Port 2	FE2 Port 2	FE1 port 2
Node 3	BE1 port 19		BE1 Port 3	BE2 Port 3	FE2 Port 3	FE1 port 3
Node 4	BE1 port 20		BE1 Port 4	BE2 Port 4	FE2 Port 4	FE1 Port 1
Node 5	BE1 port 21		BE1 Port 5	BE2 Port 5	FE2 Port 5	FE1 port 2
Node 6	BE1 port 22		BE1 Port 6	BE2 Port 6	FE2 Port 6	FE1 port 3
Node 7	BE1 port 23		BE1 Port 7	BE2 Port 7	FE2 Port 7	FE1 Port 1
Node 8	BE1 port 24		BE1 Port 8	BE2 Port 8	FE2 Port 8	FE1 port 2
Node 9	BE1 port 25		BE1 Port 9	BE2 Port 9	FE2 Port 9	FE1 port 3
Node 10	BE1 port 26		BE1 Port 10	BE2 Port 10	FE2 Port 10	FE1 Port 10
Node 11	BE1 port 27		BE1 Port 11	BE2 Port 11	FE2 Port 11	FE1 port 11
Node 12	BE1 port 28		BE1 Port 12	BE2 Port 12	FE2 Port 12	FE1 port 12
Node 13	BE1 port 29		BE1 Port 13	BE2 Port 13	FE2 Port 13	FE1 Port 13
Node 14	BE1 port 30		BE1 Port 14	BE2 Port 14	FE2 Port 14	FE1 port 14
Node 15	BE1 port 31		BE1 Port 15	BE2 Port 15	FE2 Port 15	FE1 port 15
Node 15	BE1 port 32		BE1 Port 16	BE2 Port 16	FE2 Port 16	FE1 Port 16

Figure 98. EX500 node network cable labeling


ECSv3 740xd2 Switch Cabling Diagram
Server 16
To BE Switch 2 Port 16
To BE Switch 1 Port 16
To FE Switch 2 Port 16
To FE Switch 1 Port 16
Server 15
To BE Switch 2 Port 15
To BE Switch 1 Port 15
To FE Switch 2 Port 15
To FE Switch 1 Port 15
Server 14
To BE Switch 2 Port 14
To BE Switch 1 Port 14
To FE Switch 2 Port 14
To FE Switch 1 Port 14
Server 13
To BE Switch 2 Port 13
To BE Switch 1 Port 13
To FE Switch 2 Port 13
To FE Switch 1 Port 13
Server 12
To BE Switch 2 Port 12
To BE Switch 1 Port 12
To FE Switch 2 Port 12
To FE Switch 1 Port 12
Server 11
To BE Switch 2 Port 11
To BE Switch 1 Port 11
To FE Switch 2 Port 11
To FE Switch 1 Port 11
Server 10
To BE Switch 2 Port 10
To BE Switch 1 Port 10
To FE Switch 2 Port 10
To FE Switch 1 Port 10
Server 9
To BE Switch 2 Port 9
To BE Switch 1 Port 9
To FE Switch 2 Port 9
To FE Switch 1 Port 9
Server 8
To BE Switch 2 Port 8
To BE Switch 1 Port 8
To FE Switch 2 Port 8
To FE Switch 1 Port 8
105-001-322-00 2M
FE Switch 2
See LAG Cable Table
LAG 1
Empty 1U
See LAG Cable Table
LAG 2
FE Switch 1
Service Tray
BE Switch 2
See LAG Cable Table
LAG 3
See LAG Cable Table
LAG 4
Empty 1U
038-004-797 2M
To FE Switch 1 Front Mgmt Port
GBIC 105-001-136-00 for switch
038-004-797 2M
To FE Switch 2 Front Mgmt Port
GBIC 105-001-136-00 for switch
BE Switch 1
038-004-436 100"
To Service Tray
GBIC 105-001-136-00 for switch
Server 7
To BE Switch 2 Port 7
To BE Switch 1 Port 7
To FE Switch 2 Port 7
To FE Switch 1 Port 7
Server 6
To BE Switch 2 Port 6
To BE Switch 1 Port 6
To FE Switch 2 Port 6
To FE Switch 1 Port 6
Server 5
To BE Switch 2 Port 5
To BE Switch 1 Port 5
To FE Switch 2 Port 5
To FE Switch 1 Port 5
Server 4
To BE Switch 2 Port 4
To BE Switch 1 Port 4
To FE Switch 2 Port 4
To FE Switch 1 Port 4
Server 3
To BE Switch 2 Port 3
To BE Switch 1 Port 3
To FE Switch 2 Port 3
To FE Switch 1 Port 3
Server 2
To BE Switch 2 Port 2
To BE Switch 1 Port 2
To FE Switch 2 Port 2
To FE Switch 1 Port 2
Server 1
To BE Switch 2 Port 1
To BE Switch 1 Port 1
To FE Switch 2 Port 1
To FE Switch 1 Port 1
Brace

	LAG Cable	
Switch	Primary PN	Secondary PN
S5148F-ON	105-001-329-00 (1M)	-
S5248F-ON	105-667-097-00 (0.5M)	DDW0X

Figure 99. EX500 network cabling

6

EX300 Platform

Topics:

- EX300 hardware components
- EX300 configurations
- EX300 Upgrade Paths
- EX300 server
- EX300 disk drives
- EX300 power cabling
- EX300 iDRAC cabling
- EX300 network cabling

EX300 hardware components

The EX300 ECS appliance includes the following hardware components.

Table 48. EX300 hardware components

Component	Description
40U rack	Titan D racks that include: ● Gen3 0U PDUs supporting single phase, three-phase delta, and three-phase WYE ● Front and rear doors ● Racking by Dell Technologies manufacturing In addition to the Dell Technologies-racked EX300 appliance, the EX300 nodes can be installed in customer-provided racks. For more information about third-party racking requirements, see the *ECS EX300 Third-Party Rack Installation Guide*.
Back-end (BE) switches for private network connection	● Two Dell Technologies S5148F or S5248F 25 GbE 1U Ethernet switches with 48 x 25 GbE SFP ports. ● 2 GbE VLT cables per HA pair.
Front-end (FE) switches for customer public network connection	● Two optional Dell Technologies S5148F or S5248F 25 GbE 1U Ethernet switches can be obtained for network connection or the customer can provide their own 10 GbE or 25 GbE HA pair for the front end. ● If the customer provides their own front-end switches, they must supply all VLT cables, SFPs, or external connection cables. ● If Dell Technologies S5148F 25 GbE front-end switches are used, the 25 GbE ports are configured to run at 10 GbE to connect to the EX300 nodes, and 2 x 100 GbE VLT cables are provided. ● If Dell Technologies S5248F front-end switches are used, the ports are configured to 10 Gb with a specific configuration file.
Nodes	● Minimum number of nodes per rack is 5 with increments of one node up to a maximum of 16 nodes. ● Hard drive sizes can be 1 TB, 2 TB, 4 TB, 8 TB, or 16 TB. ECS 3.5 and later supports 16 TB. (All drives sizes must be the same in the node) ● Within a Dell Technologies manufactured rack delivered from the factory, all nodes within the rack are of the exact same drive size. For node upgrades in the field, nodes with other sized drives are allowed within the rack. ● Twelve SATA hard disk drives (HDDs) in each node. ● 480 GB M.2 (BOSS) system disk in each node. ● 64 GB RAM per node. ● Single Intel Xeon 8-core 85 W CPU

Table 48. EX300 hardware components (continued)

Component	Description
	- 4x 16 GB RDIMM, 2667MT/s, Dual Rank, x4 Data Width. - Dual 750 W Platinum power supply (hot swappable). - Each node has 4 x 10 GbE networking.

EX300 configurations

Describes the EX300 ECS appliance configurations.

The front view of an EX300 rack with the minimum node configuration and an EX300 rack with the maximum node configuration is shown in the following diagram. The rear view requires a brace wherever there is empty space above or below an EX300 server.

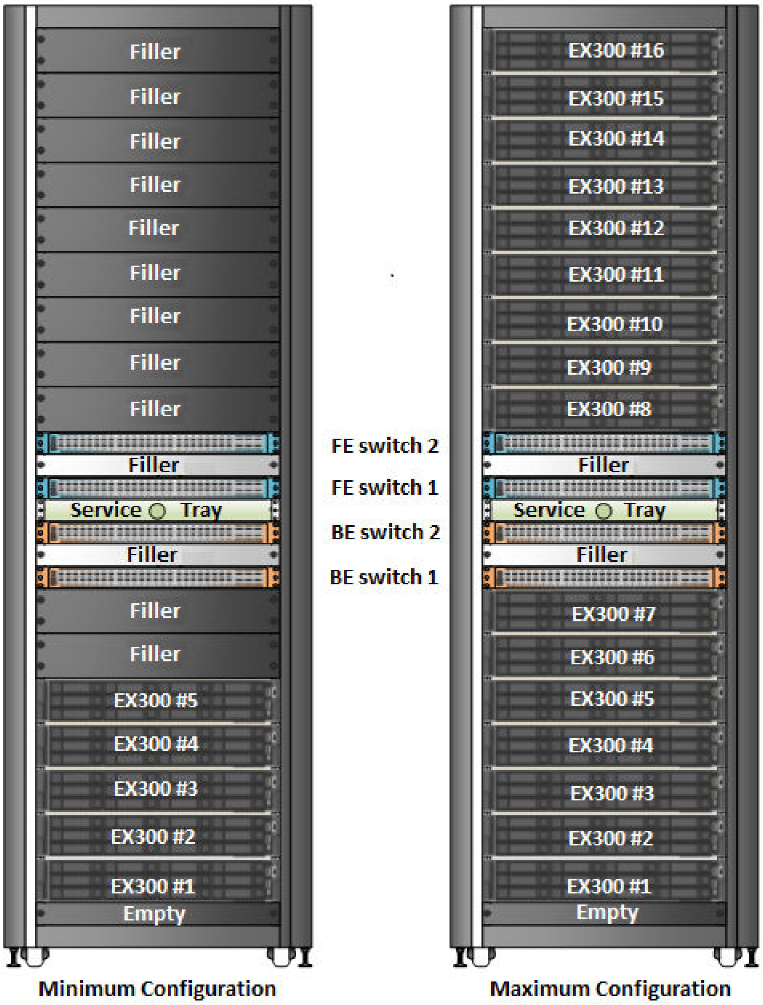

Filler
Filler
Filler
Filler
Filler
Filler
Filler
Filler
Filler
Filler
Service Tray
Filler
Filler
Filler
EX300 #5
EX300 #4
EX300 #3
EX300 #2
EX300 #1
Empty
Minimum Configuration
FE switch 2
FE switch 1
BE switch 2
BE switch 1
EX300 #16
EX300 #15
EX300 #14
EX300 #13
EX300 #12
EX300 #11
EX300 #10
EX300 #9
EX300 #8
Filler
Service Tray
Filler
EX300 #7
EX300 #6
EX300 #5
EX300 #4
EX300 #3
EX300 #2
EX300 #1
Empty
Maximum Configuration

Figure 100. EX300 minimum and maximum configurations

The EX300 appliance is available in the following configurations within a Dell EMC rack or a customer-provided rack.

Table 49. EX300 configurations

Nodes	Disks in each node	Disk Size	RAW Storage capacity
5 (minimum configuration)	12	- 1 TB - 2 TB	- 60 TB - 120 TB

Table 49. EX300 configurations (continued)

Nodes	Disks in each node	Disk Size	RAW Storage capacity
		- 4 TB - 8 TB - 16 TB	- 240 TB - 480 TB - 960 TB
6	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 72 TB - 144 TB - 288 TB - 576 TB - 1.15 PB
7	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 84 TB - 168 TB - 336 TB - 672 TB - 1.34 PB
8	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 96 TB - 192 TB - 384 TB - 768 TB - 1.54 PB
9	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 108 TB - 216 TB - 432 TB - 864 TB - 1.73 PB
10	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 120 TB - 240 TB - 480 TB - 960 TB - 1.92 PB
11	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 132 TB - 264 TB - 528 TB - 1.06 PB - 2.11 PB
12	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 144 TB - 288 TB - 576 TB - 1.15 PB - 2.3 PB
13	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 156 TB - 312 TB - 624 TB - 1.25 PB - 2.5 PB
14	12	- 1 TB - 2 TB - 4 TB - 8 TB - 16 TB	- 168 TB - 336 TB - 672 TB - 1.34 PB - 2.68 PB
15	12	- 1 TB	- 180 TB

Table 49. EX300 configurations (continued)

Nodes	Disks in each node	Disk Size	RAW Storage capacity
		• 2 TB • 4 TB • 8 TB • 16 TB	• 360 TB • 720 TB • 1.44 PB • 2.88 PB
16 (maximum configuration)	12	• 1 TB • 2 TB • 4 TB • 8 TB • 16 TB	• 192 TB • 384 TB • 768 TB • 1.54 PB • 3.07 PB

EX300 Upgrade Paths

Describes the EX300 ECS appliance upgrade paths.

If there are five or more nodes in the system (VDC) with the same disk size or total node disk capacity, the minimum node expansion is only one. This upgrade is possible when the expansion node has the same disk size or the total disk capacity of the existing nodes.

For example, you have an EX300 appliance with five nodes containing 1 TB disks or have a total disk capacity of 12 TB. You can add a single node with 1 TB disks or a total disk capacity of 12TB.

If you are adding nodes that have different disk sizes than the nodes currently in the system, you must add a minimum of five nodes at a time.

For example, you have an EX300 appliance with five nodes containing 1 TB drives. If you want to add nodes of different drive size (2 TB, 4 TB, 8 TB, or 16 TB), you must add five or more nodes, at a time.

NOTE: All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes within a rack.

There are no drive upgrades.

EX300 server

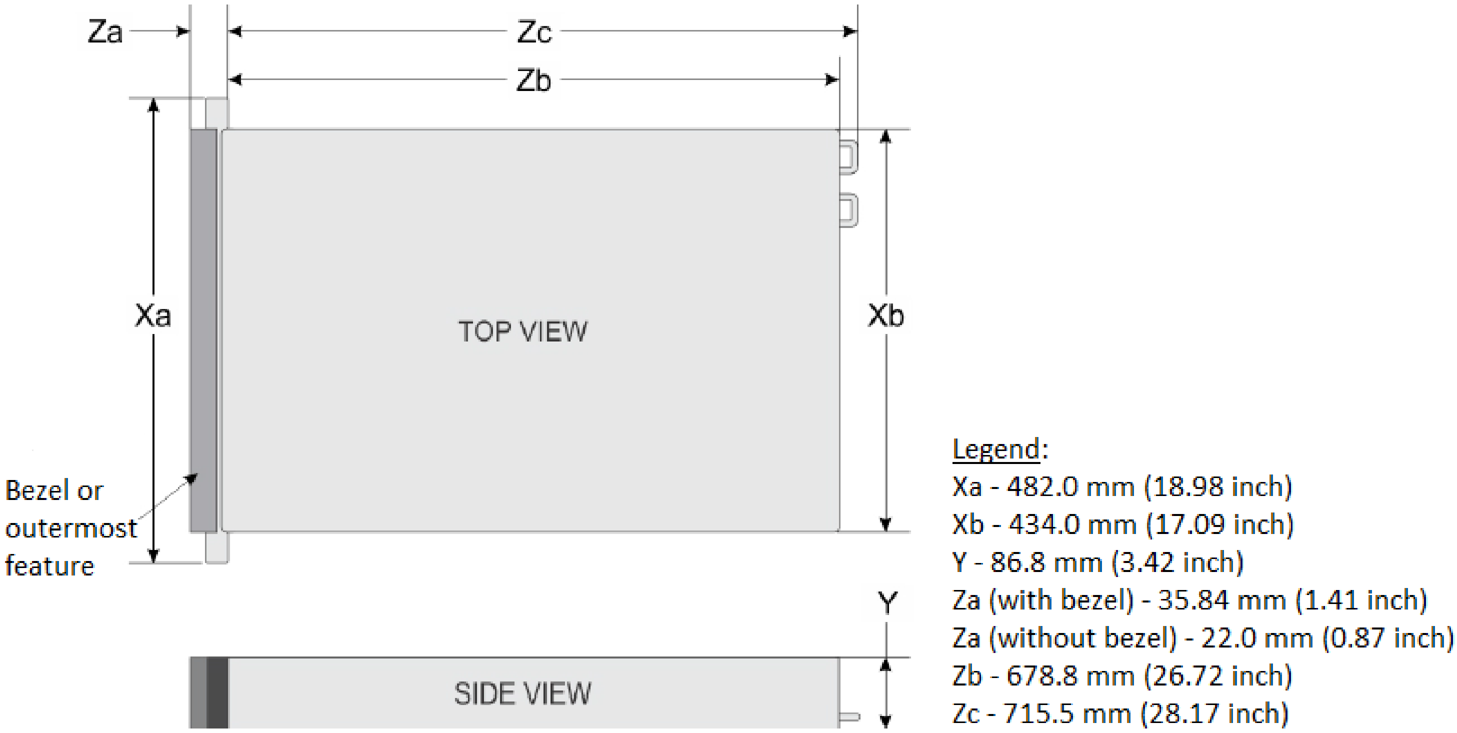
EX300 servers have the following standard features:

Table 50. Standard features of EX300 servers

Features	1 TB	2 TB	4 TB	8 TB	16 TB
HDDs in front slots	1 TB 7.2k RPM 512n SATA hard drive	2 TB 7.2k RPM 512n SATA hard drive	4 TB 7.2k RPM 512n SATA hard drive	8 TB 7.2k RPM 512e SATA hard drive	16 TB 7.2k RPM 512e SATA hard drive
SSD in rear slots	Optional 960 GB SATA MU SSD read cache. • This feature is optional and available only with 3.5 and above. For more information, see *ECS Appliance SSD Read Cache Deployment guide*.				
Chassis	• EX300 12 x 3.5" one CPU chassis • One-node server (2U) with one CPU per node • Maximum chassis weight is 33.1 kg (72.91 lb)				
Riser Configuration	• Each EX300 server supports up to eight PCI express (PCIe) Gen3 expansion cards that can be installed on the system board using three expansion card risers. • Config 1 (1 B + 2 B) • Four x8 slots and rear storage				
Processors	1 x Intel Xeon 8 core, 85 W				
Memory	4 x 16 GB RDIMM, 2667MT/s, Dual Rank, x8 Data Width				

Table 50. Standard features of EX300 servers (continued)

Disk Controller	HBA330 mini (IOC, JBOD)
NDC	Foster Flat (Quad Port 10G SFP+) Intel X710
PCIe Slot 1	BOSS controller card + with 1 M.2 stick 480 GB, FH
Management	iDRAC9 Enterprise
Power	2 x 750 W Platinum



Legend:
Xa - 482.0 mm (18.98 inch)
Xb - 434.0 mm (17.09 inch)
Y - 86.8 mm (3.42 inch)
Za (with bezel) - 35.84 mm (1.41 inch)
Za (without bezel) - 22.0 mm (0.87 inch)
Zb - 678.8 mm (26.72 inch)
Zc - 715.5 mm (28.17 inch)

Figure 101. EX300 server physical dimensions

Server front view

This topic illustrates the front view of EX300 server.

The following figure shows the EX300 2U server chassis front with 12 x 3.5" SATA HDDs.

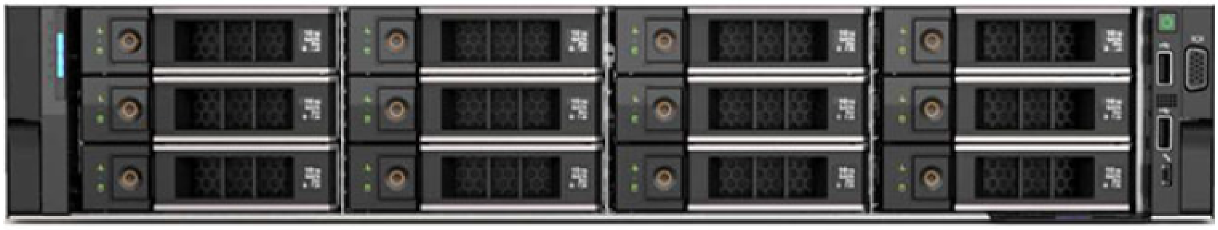


Figure 102. EX300 server chassis front view

LED indicators are on the left and right side of the server front panels.

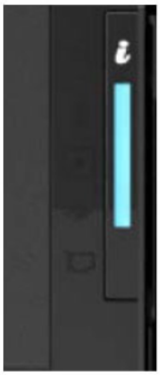


Figure 103. Left control panel

The left control panel LED behavior is broken into two subsets, the light bar and the status LEDs. The light bar also functions as a button. The light bar indicates chassis health and also functions as System ID when pressed.

Table 51. Decoding of LEDs in light bar

Status	ID button
Healthy	Solid Blue
Fault	Blink Amber
System ID	Blink Blue

There are five status LEDs to indicate and identify any failed hardware components.

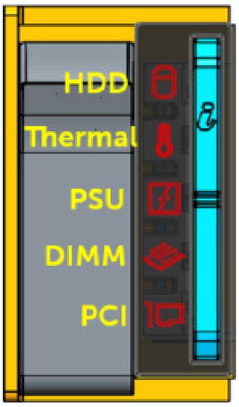


Figure 104. Status LEDs decoded view

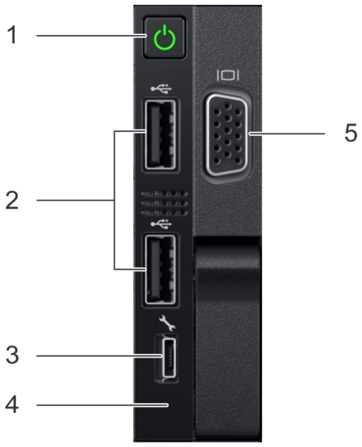


Figure 105. Right control panel

1. Power button with integrated power LED
2. Two USB 3.0 ports
3. Micro-USB for iDRAC Direct
4. Status LED for iDRAC Direct
5. VGA port

Server rear view

This topic illustrates the rear view of EX300 server.

The EX300 server chassis provides dual hot-swappable power supplies with 1 + 1 redundancy, autosensing and autoswitching capability.

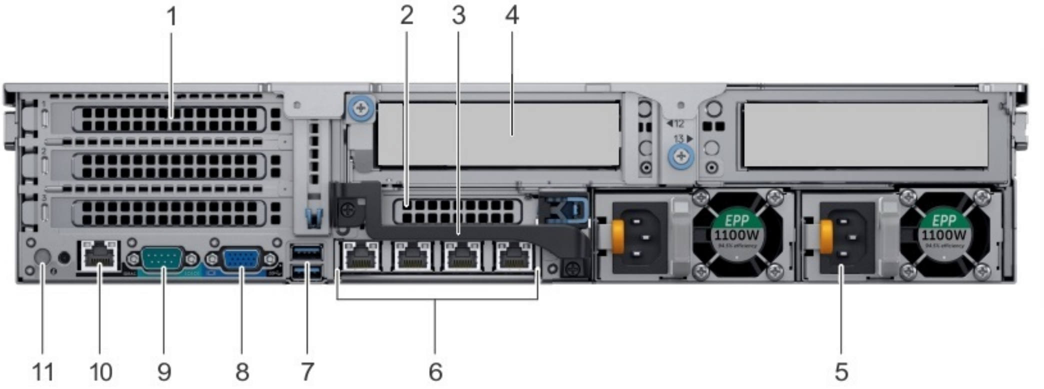


Figure 106. EX300 server chassis rear view

Table 52. Server Panel, Ports, and Slots

Item	Panel, Ports, and Slots	Description
1	Full-height PCIe expansion card slot (3)	The PCIe expansion card slot (riser 1) connects up to three full-height PCIe expansion cards to the system. The Boot Optimized Storage Subsystem (BOSS) controller card with one M.2 stick is in the top PCIe slot (slot 1).
2	Half-height PCIe expansion card slot	The PCIe expansion card slot (riser 2) connects one half-height PCIe expansion card to the system.
3	Rear handle	The rear handle can be removed to enable any external cabling of PCIe cards that are installed in the PCIe expansion card slot 6.
4	Drive slots	The two rear 3.5-inch rear drive slots contain fillers. SSD Cache SSD upgrade 960 GB SATA MU SSD
5	Power supply unit (2)	Two AC power supply units (PSUs)
6	NIC ports	The NIC ports that are integrated on the network daughter card (NDC) provide network connectivity. The two left 10 GbE data ports of each node connect to one of the data ports on the back-end switches. The two right 10 GbE data ports of each node connect to one of the data ports on the front-end switches.
7	USB port (2)	The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.
8	VGA port	The VGA port enables you to connect a display device to the system.
9	Serial port	The Serial port enables you to connect a serial device to the system.
10	iDRAC9 dedicated port	This port enables you to remotely access iDRAC. For more information, see the Integrated Dell Remote Access Controller 9 (iDRAC9) User's Guide.
11	System identification button	The System Identification (ID) button is available on the front and back of the systems. Press the button to identify a system in a rack by turning

Table 52. Server Panel, Ports, and Slots (continued)

Item	Panel, Ports, and Slots	Description
		on the system ID button. You can also use the system ID button to reset iDRAC and to access BIOS using the step through mode.

EX300 disk drives

Describes the disk drives that are integrated into the server chassis of the EX300 appliance.

EX300 nodes contain twelve 3.5 inch SATA front-accessible, hot-swappable drives in slots 0 to 11. Disk size can be 1 TB, 2 TB, 4 TB, 8 TB, or 16 TB. All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes within a rack. In PCIe slot 1 of each node there is a 480 GB Boot Optimized Storage Subsystem (BOSS) controller card with one M.2 stick.

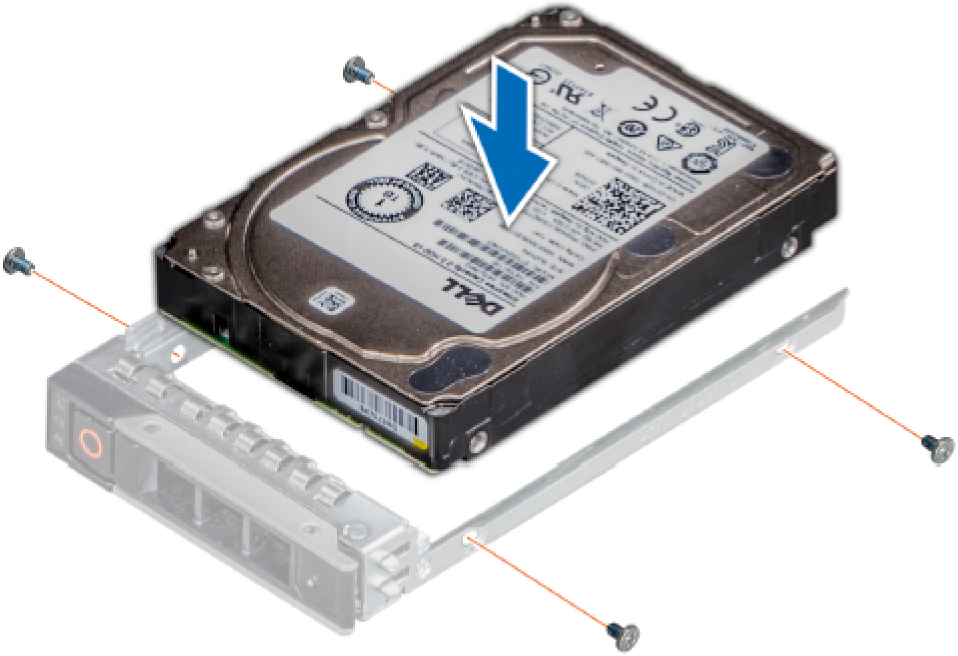


Figure 107. EX300 disk drive in carrier

EX300 power cabling

Provides EX300 ECS appliance cabling diagrams for single-phase AC power and three-phase delta and WYE AC power.

Use the power and weight calculator to refine the power and heat values to more-closely match the hardware configuration for your system. The calculator contains the latest information for power and weight planning.

ⓘ **NOTE:** The power distribution for the EX300 single phase racked solution has changed. Recent testing showed that the EX300 SSDR model encroached into the power margins. It is recommended to modify the power distribution as displayed in this document to ensure HA power availability for all configurations and environments.

The EX300 appliance connections to 0U PDU and 2U PDU outlets are listed in the following tables.

Table 53. EX300 0U PDU cabling

PDU cabling	PS1 outlet numbers	PS2 outlet numbers	Line cord per zone (Single phase)
	Zone B	Zone A	
	Black cables	Gray cables	
Node 16	24	24	2

Table 53. EX300 0U PDU cabling (continued)

PDU cabling	PS1 outlet numbers	PS2 outlet numbers	Line cord per zone (Single phase)
	Zone B	**Zone A**	
	Black cables	**Gray cables**	
Node 15	23	23	2
Node 14	22	23	2
Node 13	21	23	2
Node 12	20	23	2
Node 11	19	23	2
Node 10	15	15	1
Node 9	14	14	1
Node 8	13	13	1
FE 2	12	12	1
FE 1	11	11	1
Service Tray and Light Bar	10	10	1
BE 2	9	9	1
BE 1	8	8	1
Node 7	7	7	1
Node 6	6	6	1
Node 5	5	5	1
Node 4	4	4	1
Node 3	3	3	1
Node 2	2	2	1
Node 1	1	1	1

Table 54. EX300 2U PDU cabling

2U PDU cabling	PS1 outlet numbers	PS2 outlet numbers	Line cord per zone (Single phase)
	Zone B	**Zone A**	
	Black cables	**Gray cables**	
Node 16	21	21	3
Node 15	12	12	3
Node 14	11	11	3
Node 13	10	10	3
Node 12	9	9	3
Node 11	20	20	2
Node 10	19	19	2
Node 9	18	18	2
Node 8	17	17	2
FE 2	13	13	1
FE 1	1	1	1

Table 54. EX300 2U PDU cabling (continued)

2U PDU cabling	PS1 outlet numbers	PS2 outlet numbers	Line cord per zone (Single phase)
	Zone B	**Zone A**	
	Black cables	**Gray cables**	
Service Tray and Light Bar	8	8	2
BE 2	14	14	1
BE 1	2	2	1
Node 7	7	7	2
Node 6	6	6	2
Node 5	5	5	2
Node 4	16	16	1
Node 3	15	15	1
Node 2	4	4	1
Node 1	3	3	1

In the following diagrams, the switches plug into the front of the rack and route through the rails to the rear.

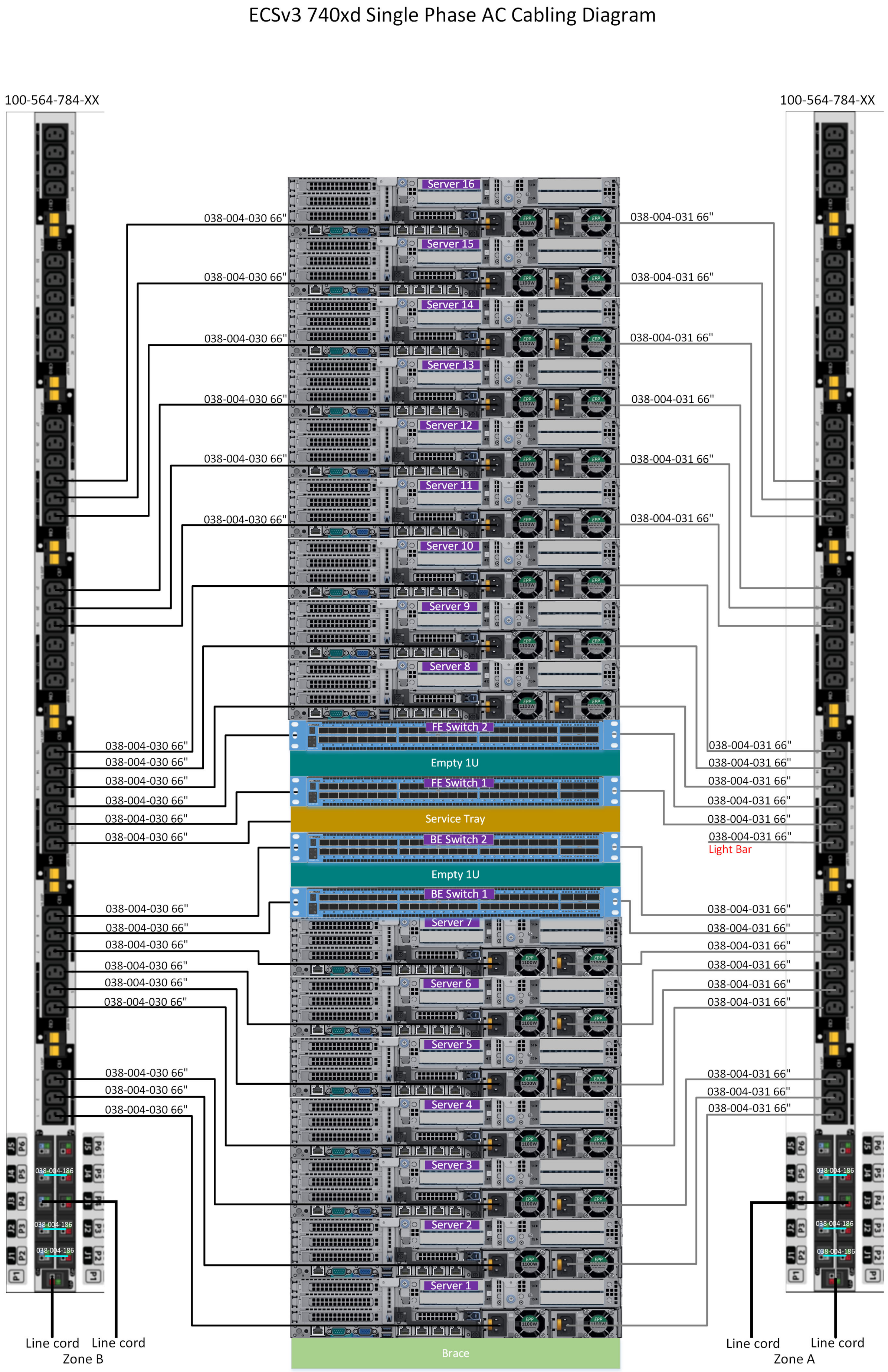
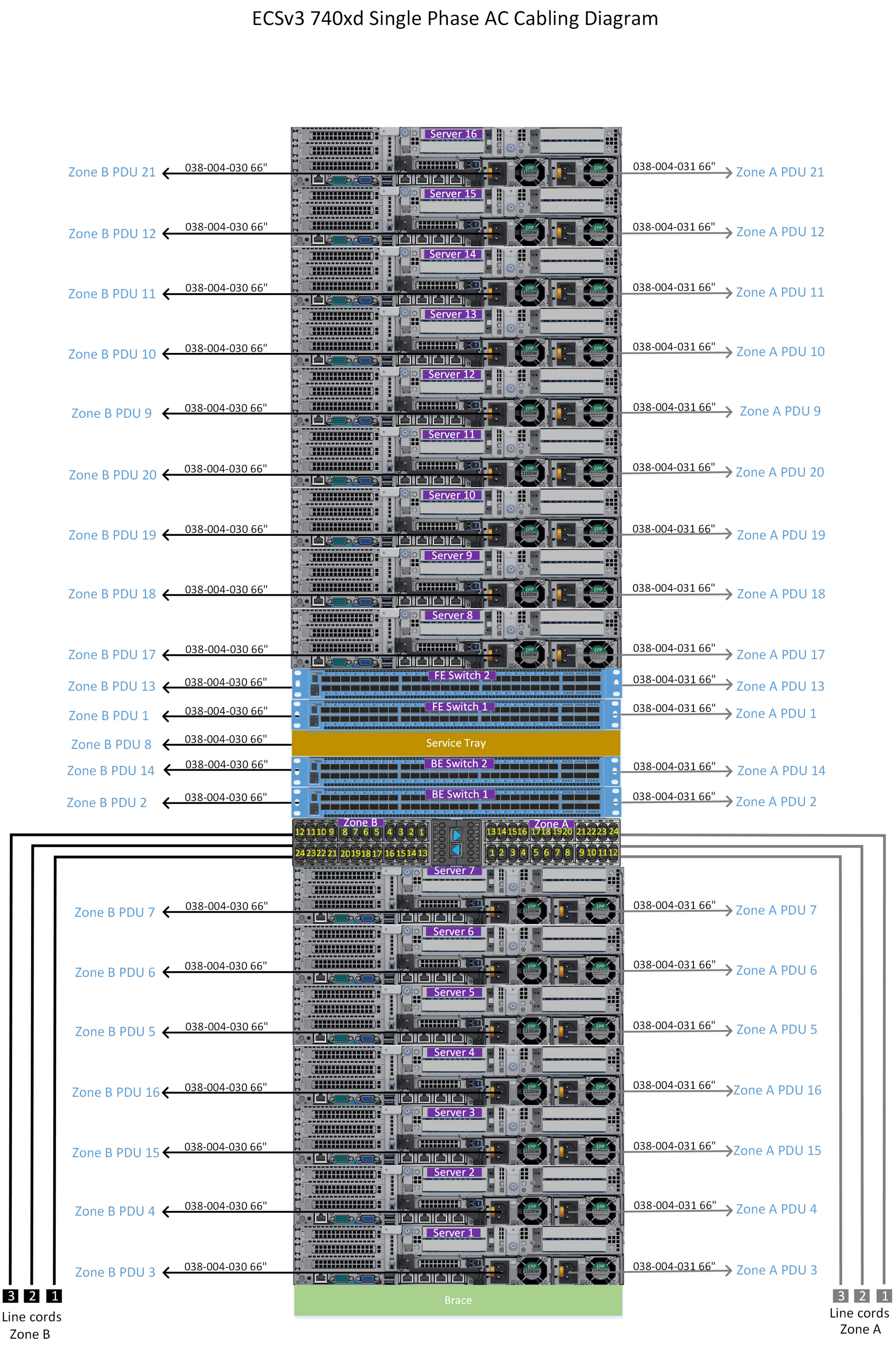

ECSv3 740xd Single Phase AC Cabling Diagram
100-564-784-XX
100-564-784-XX
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
038-004-030 66"
038-004-031 66"
Light Bar
038-004-186
Line cord
Line cord
Zone B
Line cord
Line cord
Zone A

Figure 108. EX300 single-phase AC power cabling


ECSv3 740xd Single Phase AC Cabling Diagram

Server 16
Zone B PDU 21
038-004-030 66"
038-004-031 66"
Zone A PDU 21
Server 15
Zone B PDU 12
038-004-030 66"
038-004-031 66"
Zone A PDU 12
Server 14
Zone B PDU 11
038-004-030 66"
038-004-031 66"
Zone A PDU 11
Server 13
Zone B PDU 10
038-004-030 66"
038-004-031 66"
Zone A PDU 10
Server 12
Zone B PDU 9
038-004-030 66"
038-004-031 66"
Zone A PDU 9
Server 11
Zone B PDU 20
038-004-030 66"
038-004-031 66"
Zone A PDU 20
Server 10
Zone B PDU 19
038-004-030 66"
038-004-031 66"
Zone A PDU 19
Server 9
Zone B PDU 18
038-004-030 66"
038-004-031 66"
Zone A PDU 18
Server 8
Zone B PDU 17
038-004-030 66"
038-004-031 66"
Zone A PDU 17
FE Switch 2
Zone B PDU 13
038-004-030 66"
038-004-031 66"
Zone A PDU 13
FE Switch 1
Zone B PDU 1
038-004-030 66"
038-004-031 66"
Zone A PDU 1
Service Tray
Zone B PDU 8
038-004-030 66"
BE Switch 2
Zone B PDU 14
038-004-030 66"
038-004-031 66"
Zone A PDU 14
BE Switch 1
Zone B PDU 2
038-004-030 66"
038-004-031 66"
Zone A PDU 2
Zone B
Zone A
Server 7
Zone B PDU 7
038-004-030 66"
038-004-031 66"
Zone A PDU 7
Server 6
Zone B PDU 6
038-004-030 66"
038-004-031 66"
Zone A PDU 6
Server 5
Zone B PDU 5
038-004-030 66"
038-004-031 66"
Zone A PDU 5
Server 4
Zone B PDU 16
038-004-030 66"
038-004-031 66"
Zone A PDU 16
Server 3
Zone B PDU 15
038-004-030 66"
038-004-031 66"
Zone A PDU 15
Server 2
Zone B PDU 4
038-004-030 66"
038-004-031 66"
Zone A PDU 4
Server 1
Zone B PDU 3
038-004-030 66"
038-004-031 66"
Zone A PDU 3
Brace
3 2 1
Line cords
Zone B
3 2 1
Line cords
Zone A

Figure 109. ECSv3 740xd Single Phase AC Cabling Diagram

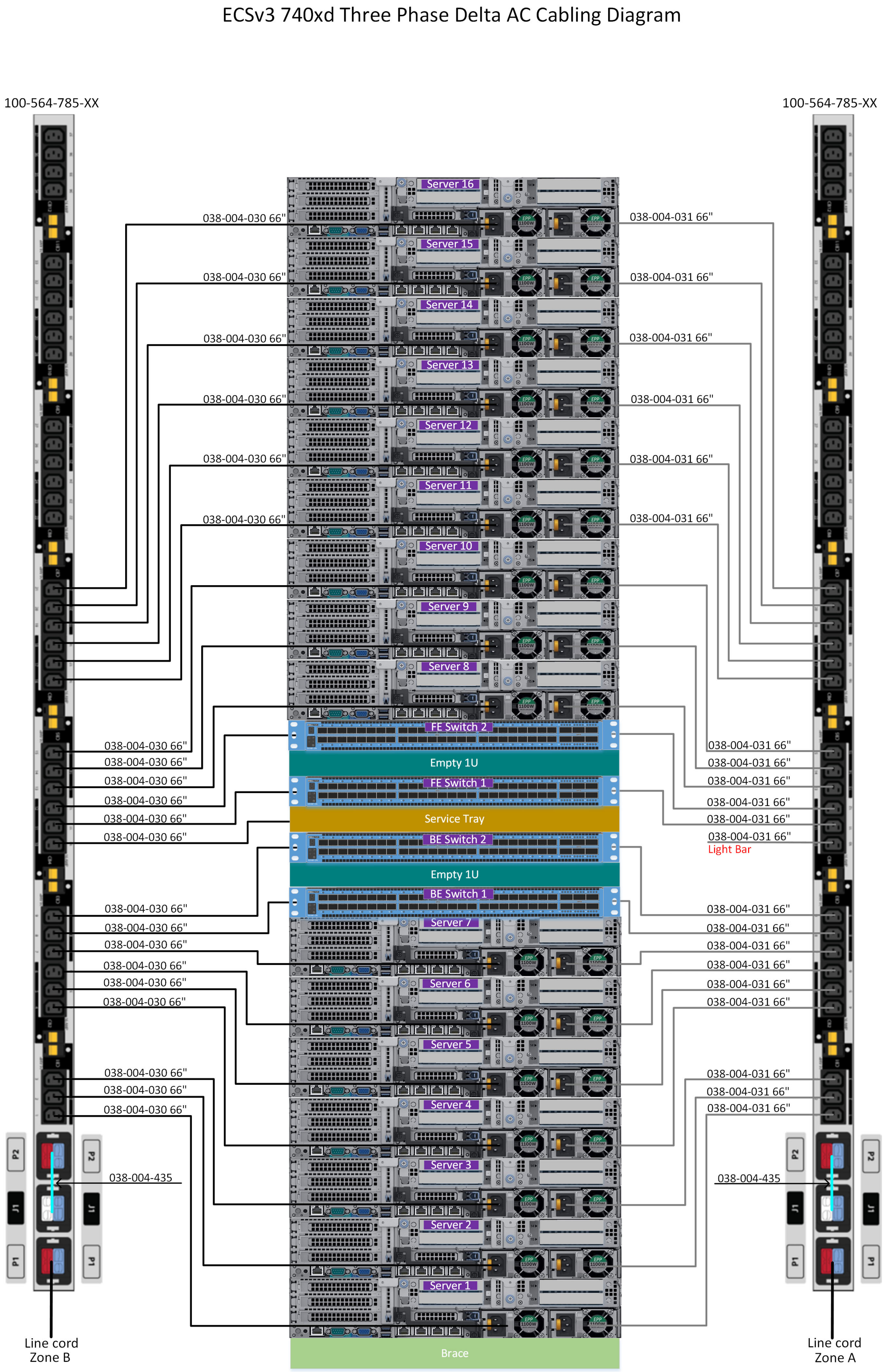

ECSv3 740xd Three Phase Delta AC Cabling Diagram
100-564-785-XX
100-564-785-XX
Server 16
Server 15
Server 14
Server 13
Server 12
Server 11
Server 10
Server 9
Server 8
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
Server 7
Server 6
Server 5
Server 4
Server 3
Server 2
Server 1
Brace
038-004-030 66"
038-004-031 66"
Light Bar
038-004-435
038-004-435
P2
J1
P1
Line cord
Zone B
Line cord
Zone A

Figure 110. Three-phase Delta AC power cabling

ECSv3 740xd Three Phase Delta AC Cabling Diagram

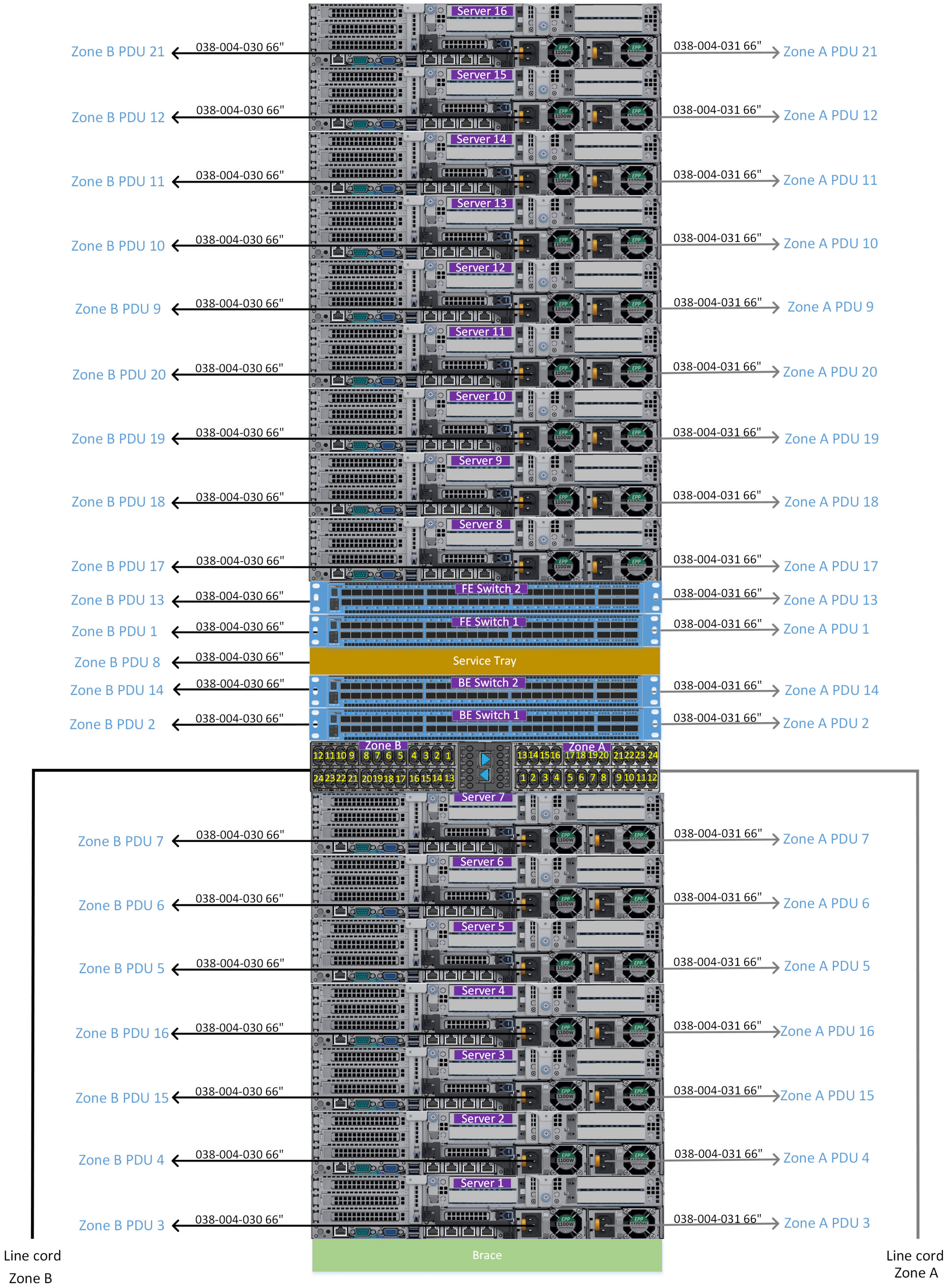

Server 16
Zone B PDU 21
038-004-030 66"
038-004-031 66"
Zone A PDU 21
Server 15
Zone B PDU 12
038-004-030 66"
038-004-031 66"
Zone A PDU 12
Server 14
Zone B PDU 11
038-004-030 66"
038-004-031 66"
Zone A PDU 11
Server 13
Zone B PDU 10
038-004-030 66"
038-004-031 66"
Zone A PDU 10
Server 12
Zone B PDU 9
038-004-030 66"
038-004-031 66"
Zone A PDU 9
Server 11
Zone B PDU 20
038-004-030 66"
038-004-031 66"
Zone A PDU 20
Server 10
Zone B PDU 19
038-004-030 66"
038-004-031 66"
Zone A PDU 19
Server 9
Zone B PDU 18
038-004-030 66"
038-004-031 66"
Zone A PDU 18
Server 8
Zone B PDU 17
038-004-030 66"
038-004-031 66"
Zone A PDU 17
FE Switch 2
Zone B PDU 13
038-004-030 66"
038-004-031 66"
Zone A PDU 13
FE Switch 1
Zone B PDU 1
038-004-030 66"
038-004-031 66"
Zone A PDU 1
Service Tray
Zone B PDU 8
038-004-030 66"
BE Switch 2
Zone B PDU 14
038-004-030 66"
038-004-031 66"
Zone A PDU 14
BE Switch 1
Zone B PDU 2
038-004-030 66"
038-004-031 66"
Zone A PDU 2
Zone B
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
Zone A
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
Server 7
Zone B PDU 7
038-004-030 66"
038-004-031 66"
Zone A PDU 7
Server 6
Zone B PDU 6
038-004-030 66"
038-004-031 66"
Zone A PDU 6
Server 5
Zone B PDU 5
038-004-030 66"
038-004-031 66"
Zone A PDU 5
Server 4
Zone B PDU 16
038-004-030 66"
038-004-031 66"
Zone A PDU 16
Server 3
Zone B PDU 15
038-004-030 66"
038-004-031 66"
Zone A PDU 15
Server 2
Zone B PDU 4
038-004-030 66"
038-004-031 66"
Zone A PDU 4
Server 1
Zone B PDU 3
038-004-030 66"
038-004-031 66"
Zone A PDU 3
Brace
Line cord
Zone B
Line cord
Zone A

Figure 111. ECSv3 740xd Three Phase Delta AC Cabling Diagram

ECSv3 740xd Three Phase WYE AC Cabling Diagram

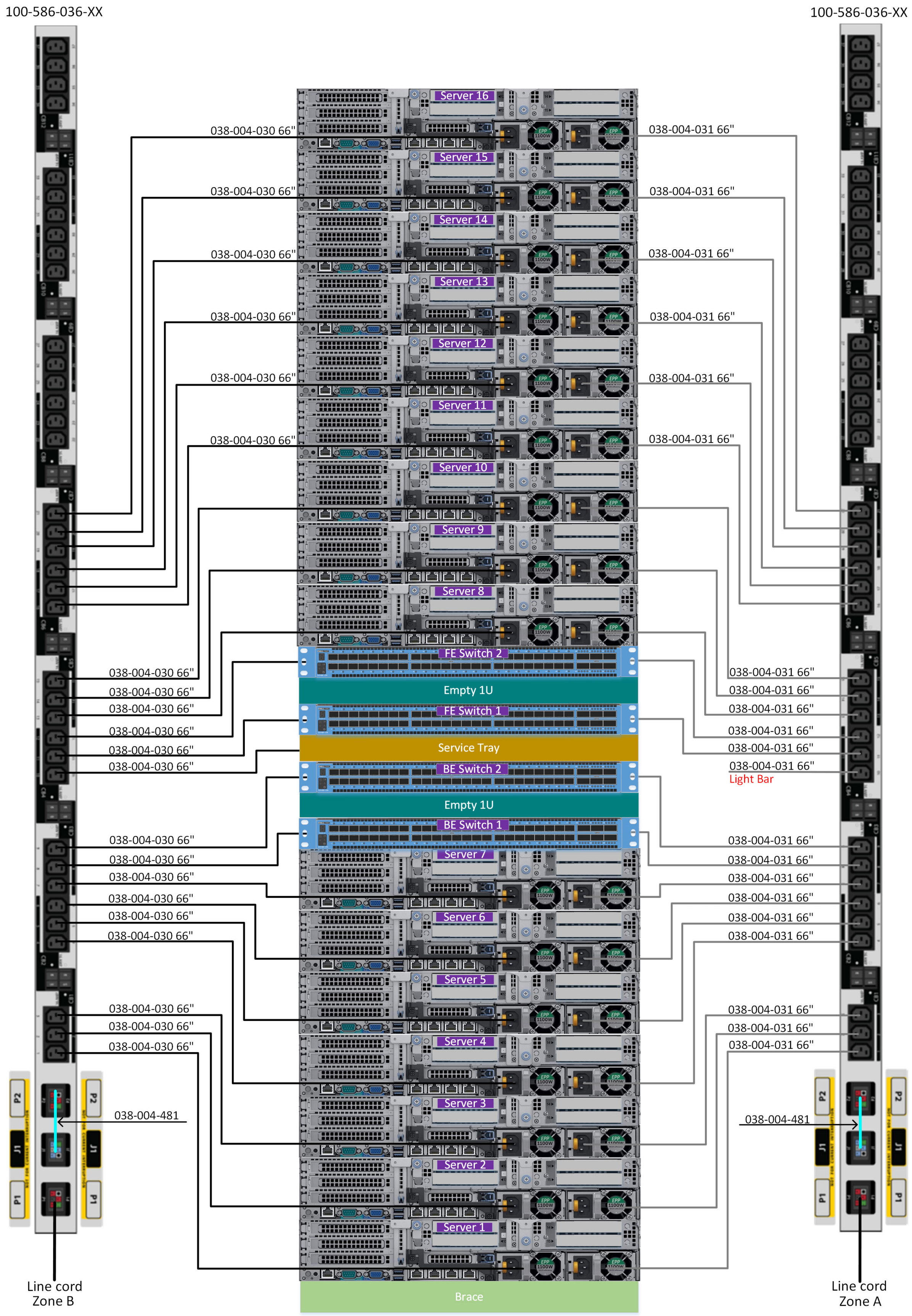

100-586-036-XX
100-586-036-XX
Server 16
038-004-030 66"
038-004-031 66"
Server 15
038-004-030 66"
038-004-031 66"
Server 14
038-004-030 66"
038-004-031 66"
Server 13
038-004-030 66"
038-004-031 66"
Server 12
038-004-030 66"
038-004-031 66"
Server 11
038-004-030 66"
038-004-031 66"
Server 10
Server 9
Server 8
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Light Bar
Server 7
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Server 6
Server 5
038-004-030 66"
038-004-030 66"
038-004-030 66"
038-004-031 66"
038-004-031 66"
038-004-031 66"
Server 4
Server 3
Server 2
Server 1
038-004-481
038-004-481
P2
J1
P1
P2
J1
P1
Line cord
Zone B
Line cord
Zone A
Brace

Figure 112. Three-phase WYE AC power cabling

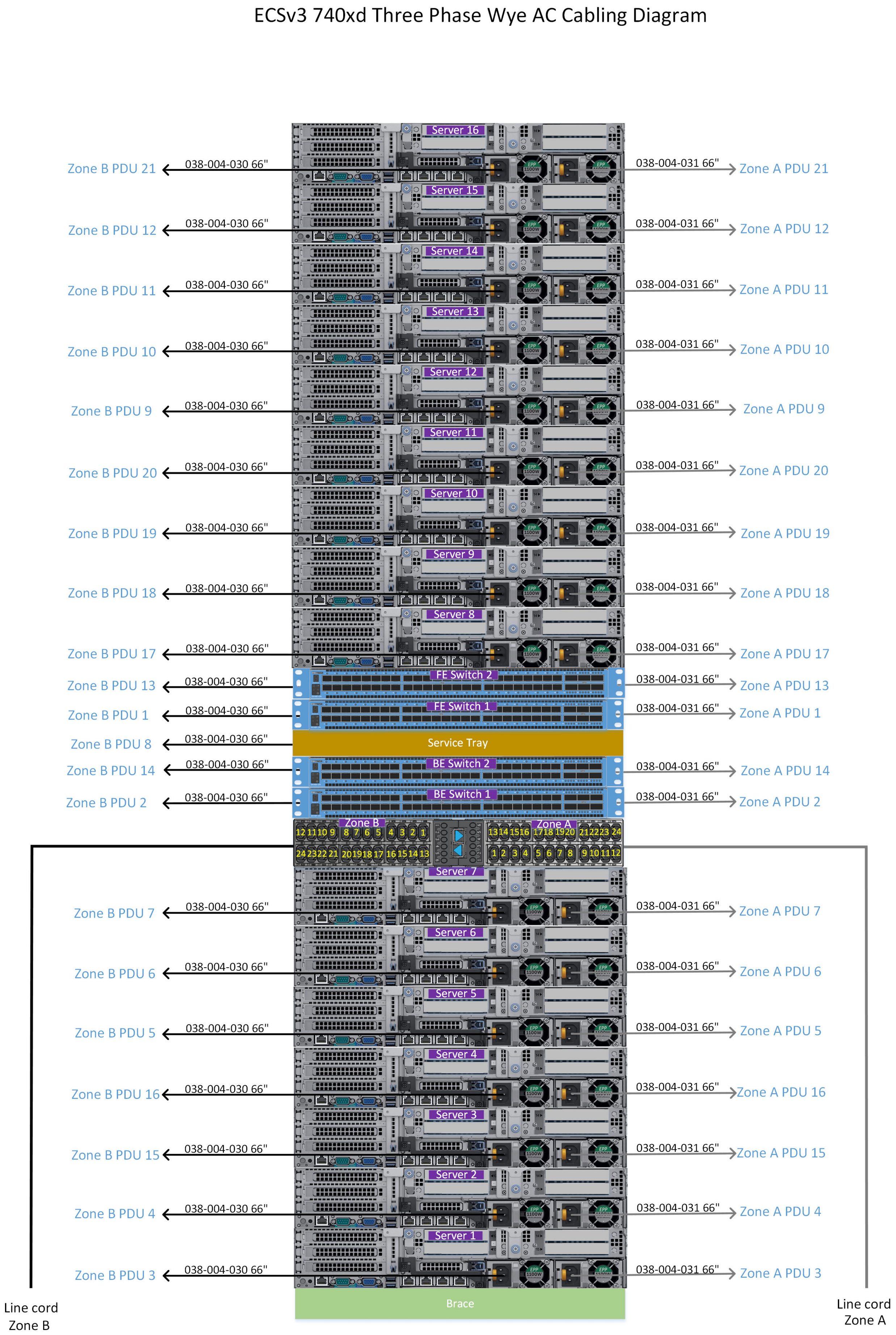

ECSv3 740xd Three Phase Wye AC Cabling Diagram
Server 16
Zone B PDU 21
038-004-030 66"
038-004-031 66"
Zone A PDU 21
Server 15
Zone B PDU 12
Zone A PDU 12
Server 14
Zone B PDU 11
Zone A PDU 11
Server 13
Zone B PDU 10
Zone A PDU 10
Server 12
Zone B PDU 9
Zone A PDU 9
Server 11
Zone B PDU 20
Zone A PDU 20
Server 10
Zone B PDU 19
Zone A PDU 19
Server 9
Zone B PDU 18
Zone A PDU 18
Server 8
Zone B PDU 17
Zone A PDU 17
FE Switch 2
Zone B PDU 13
Zone A PDU 13
FE Switch 1
Zone B PDU 1
Zone A PDU 1
Service Tray
Zone B PDU 8
BE Switch 2
Zone B PDU 14
Zone A PDU 14
BE Switch 1
Zone B PDU 2
Zone A PDU 2
Zone B
Zone A
Server 7
Zone B PDU 7
Zone A PDU 7
Server 6
Zone B PDU 6
Zone A PDU 6
Server 5
Zone B PDU 5
Zone A PDU 5
Server 4
Zone B PDU 16
Zone A PDU 16
Server 3
Zone B PDU 15
Zone A PDU 15
Server 2
Zone B PDU 4
Zone A PDU 4
Server 1
Zone B PDU 3
Zone A PDU 3
Brace
Line cord
Zone B
Line cord
Zone A

Figure 113. ECSv3 740xd Three Phase WYE AC Cabling Diagram

EX300 iDRAC cabling

This section provides wiring diagrams for the iDRAC cables that connect the iDRAC port on the node to the Fox back-end switch.

The Fox switch (BE1) port numbers used for connecting to the iDRAC ports on the EX300 nodes are shown in the following diagram.

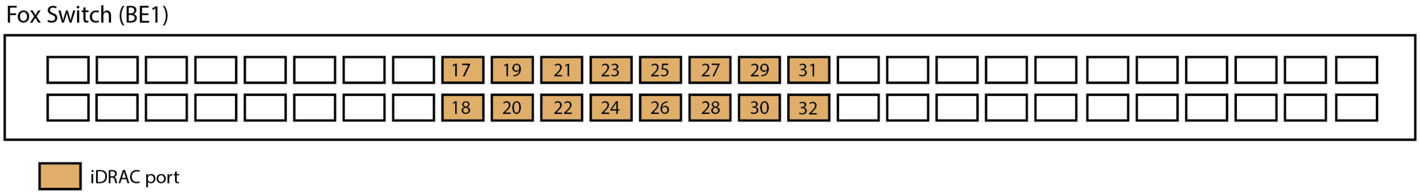


Figure 114. Fox switch iDRAC ports

The EX300 node iDRAC port to the Fox switch (BE1) port connections are listed in the following table.

Table 55. EX300 node iDRAC port to BE1 port mapping

Node 1 iDRAC port	BE1 Port 17
Node 2 iDRAC port	BE1 Port 18
Node 3 iDRAC port	BE1 Port 19
Node 4 iDRAC port	BE1 Port 20
Node 5 iDRAC port	BE1 Port 21
Node 6 iDRAC port	BE1 Port 22
Node 7 iDRAC port	BE1 Port 23
Node 8 iDRAC port	BE1 Port 24
Node 9 iDRAC port	BE1 Port 25
Node 10 iDRAC port	BE1 Port 26
Node 11 iDRAC port	BE1 Port 27
Node 12 iDRAC port	BE1 Port 28
Node 13 iDRAC port	BE1 Port 29
Node 14 iDRAC port	BE1 Port 30
Node 15 iDRAC port	BE1 Port 31
Node 16 iDRAC port	BE1 Port 32

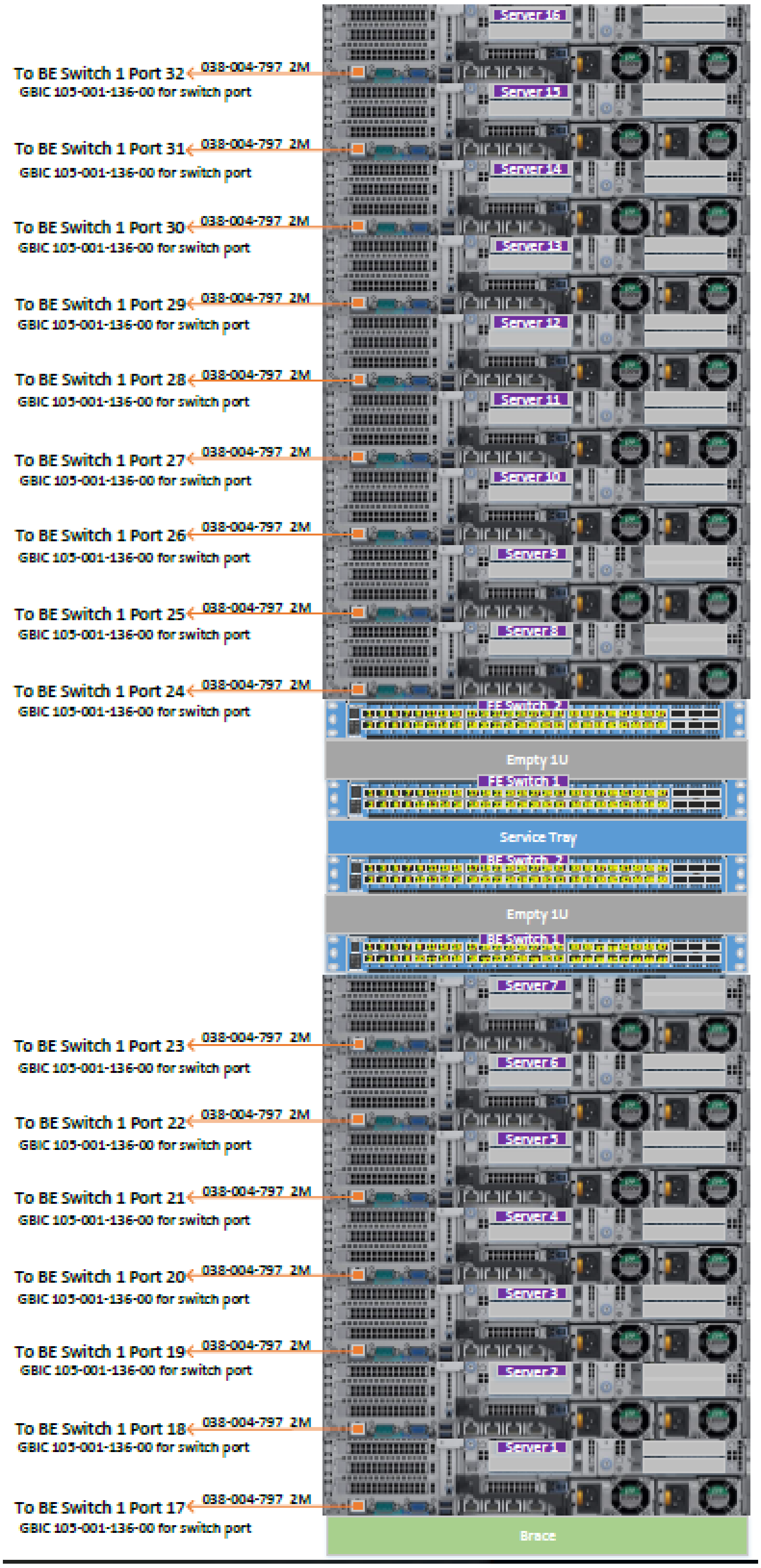

Server 16
To BE Switch 1 Port 32
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 15
To BE Switch 1 Port 31
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 14
To BE Switch 1 Port 30
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 13
To BE Switch 1 Port 29
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 12
To BE Switch 1 Port 28
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 11
To BE Switch 1 Port 27
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 10
To BE Switch 1 Port 26
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 9
To BE Switch 1 Port 25
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 8
To BE Switch 1 Port 24
038-004-797 2M
GBIC 105-001-136-00 for switch port
FE Switch 2
Empty 1U
FE Switch 1
Service Tray
BE Switch 2
Empty 1U
BE Switch 1
Server 7
To BE Switch 1 Port 23
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 6
To BE Switch 1 Port 22
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 5
To BE Switch 1 Port 21
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 4
To BE Switch 1 Port 20
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 3
To BE Switch 1 Port 19
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 2
To BE Switch 1 Port 18
038-004-797 2M
GBIC 105-001-136-00 for switch port
Server 1
To BE Switch 1 Port 17
038-004-797 2M
GBIC 105-001-136-00 for switch port
Brace

Figure 115. iDRAC cabling

EX300 network cabling

The network cabling diagrams apply to the EX300 appliance in a Dell Technologies or customer-provided rack.

Customers connect to an EX300 appliance by way of 25 GbE ports on the front-end switches. For an EX300 appliance, the 25 GbE ports run at 10 GbE. Customer configurations can include 25 GbE front-end switches provided by Dell Technologies or customers may provide their own front-end switches.

To distinguish between the two front-end switches and the two back-end switches, each switch has a nickname for S5148F:

- Hare: The top S5148F 1U 25 GbE front-end switch running 10 GbE SFP28 ports to EX300 nodes. It is located above the Rabbit switch in U22 of the EX300 rack.
- Rabbit: The bottom S5148F 1U 25 GbE front-end switch running 10 GbE SFP28 ports to EX300 nodes. It is located below the Hare switch in U20 of the EX300 rack.
- Hound: The top S5148F 1U 25 GbE back-end switch running 10 GbE SFP28 ports to the nodes. It is located above the Fox switch in U18 of the EX300 rack.
- Fox: The bottom S5148F 1U 25 GbE back-end switch running 10 GbE SFP28 ports to the nodes. It is located below the Hound switch in U16 of the EX300 rack.

To distinguish between the two front-end switches and the two back-end switches, each switch has a nickname for S5248F:

- Hare: The top S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX300 nodes.
- Rabbit: The bottom S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX300 nodes.
- Hound: The top S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX300 nodes.
- Fox: The bottom S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX300 nodes.

The front-end switch and back-end switch connections to an EX300 node are shown in the following diagram.

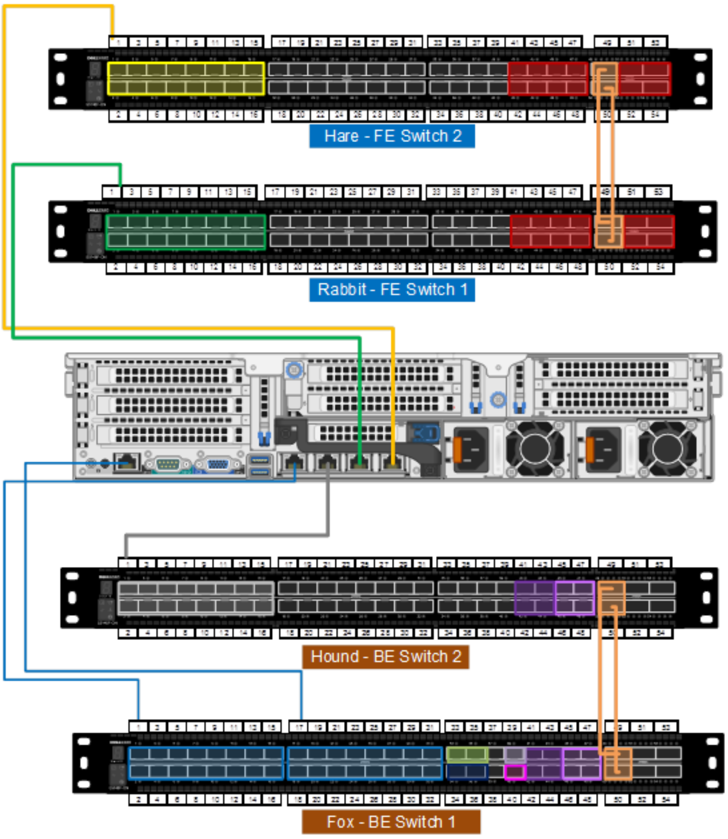
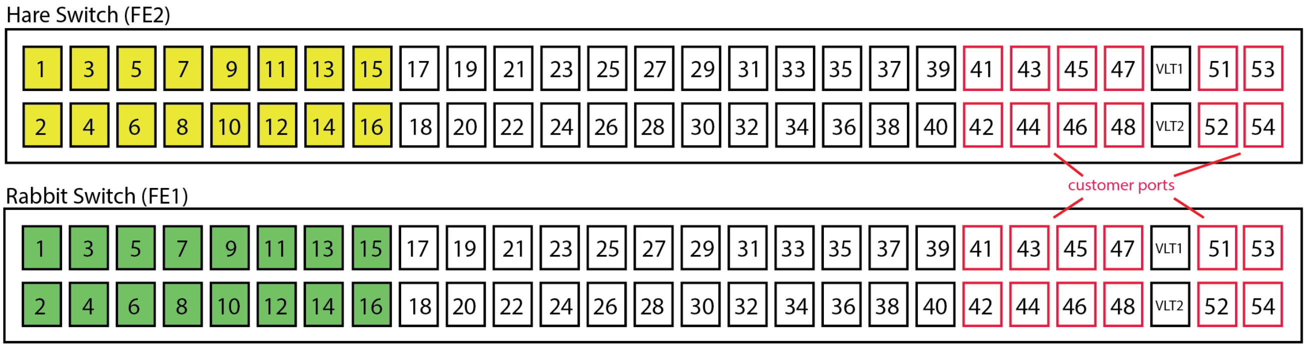


Figure 116. Front-end and back-end switch connections to an EX300 node

The numbered front-end switch ports used for connecting to the ports on the EX300 nodes are shown in the following diagram. Port 1 on the Hare switch (FE2) connects to port 4 on Node 1. Port 2 on the Hare switch (FE2) connects to port 4 on Node 2, and so on. Similarly, Port 1 on the Rabbit switch (FE1) connects to port 3 on Node 1. Port 2 on the Rabbit switch (FE1) connects to port 3 on Node 2, and so on.



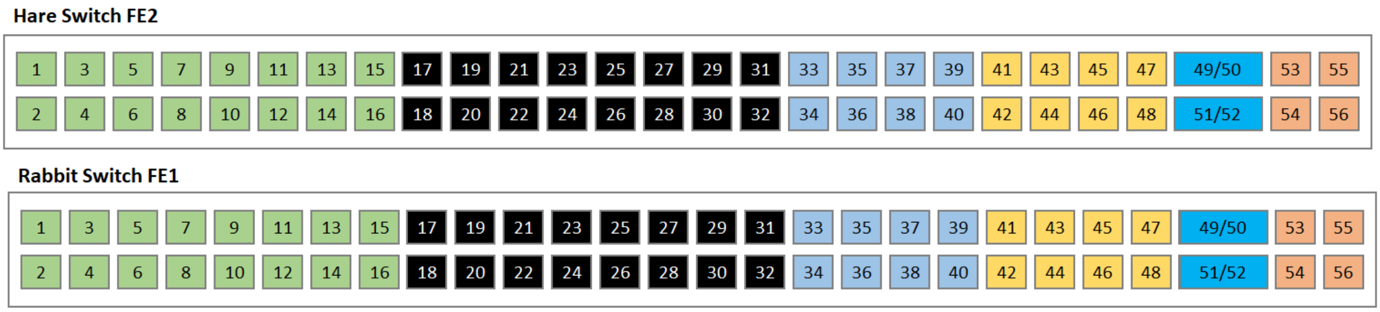
Hare Switch (FE2)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Rabbit Switch (FE1)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Figure 117. Node ports on front-end S5148F switches



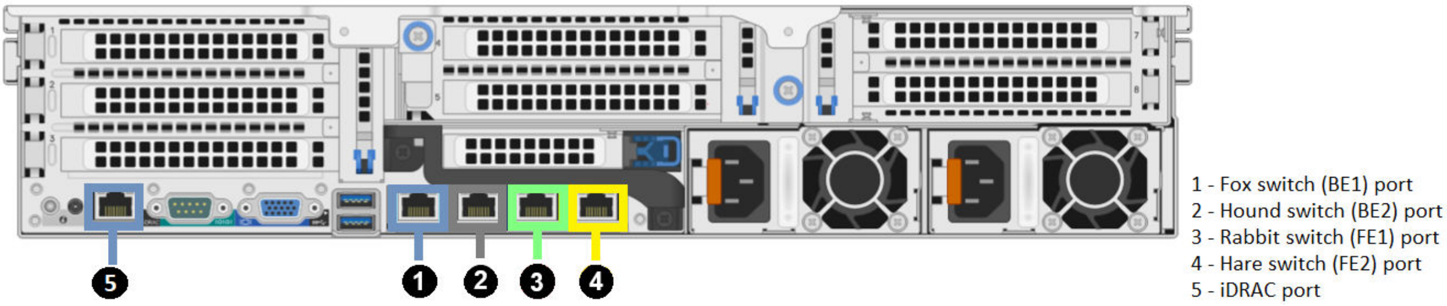
Hare Switch FE2

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Rabbit Switch FE1

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

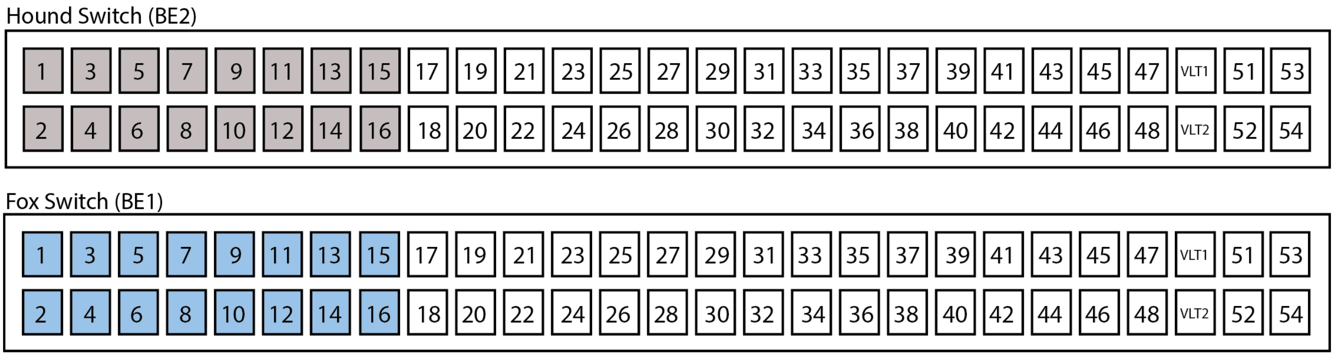
Figure 118. Node ports on front-end S5248F switches



1 - Fox switch (BE1) port
2 - Hound switch (BE2) port
3 - Rabbit switch (FE1) port
4 - Hare switch (FE2) port
5 - iDRAC port

Figure 119. Back-end switch, front-end switch, and iDRAC ports on an EX300 node

The numbered back-end switch ports used for connecting to the ports on the EX300 nodes are shown in the following diagram. Port 1 on the Hound switch (BE2) connects to port 2 on Node 1. Port 2 on the Hound switch (BE2) connects to port 2 on Node 2, and so on. Similarly, Port 1 on the Fox switch (BE1) connects to port 1 on Node 1. Port 2 on the Fox switch (BE1) connects to port 1 on Node 2, and so on.



Hound Switch (BE2)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Fox Switch (BE1)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Figure 120. Node ports on back-end S5148F switches

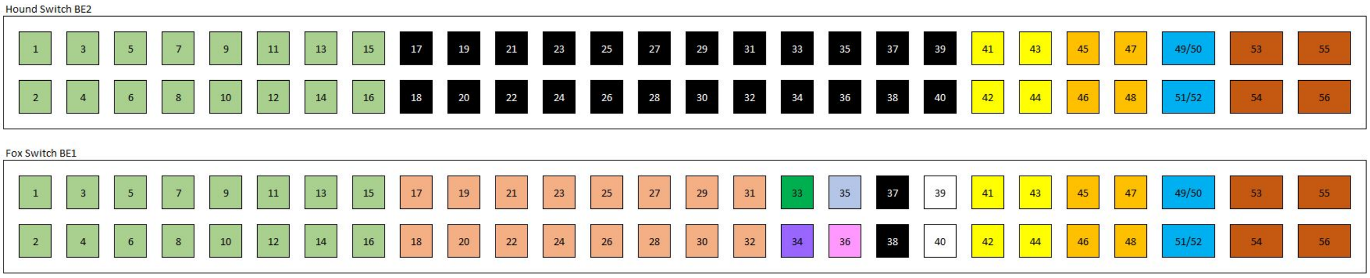
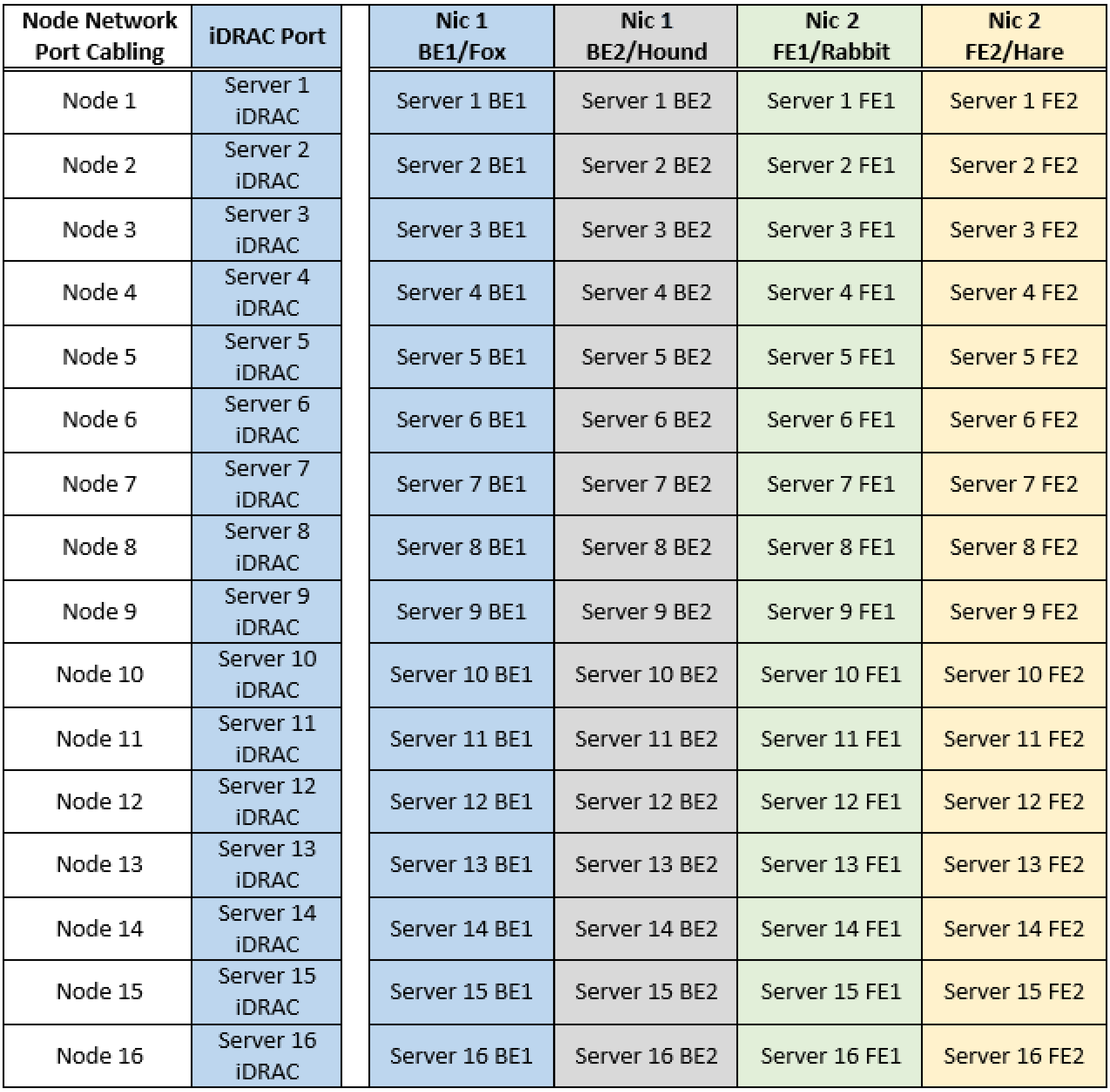

Hound Switch BE2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56
Fox Switch BE1
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56

Figure 121. Node ports on back-end S5248F switches

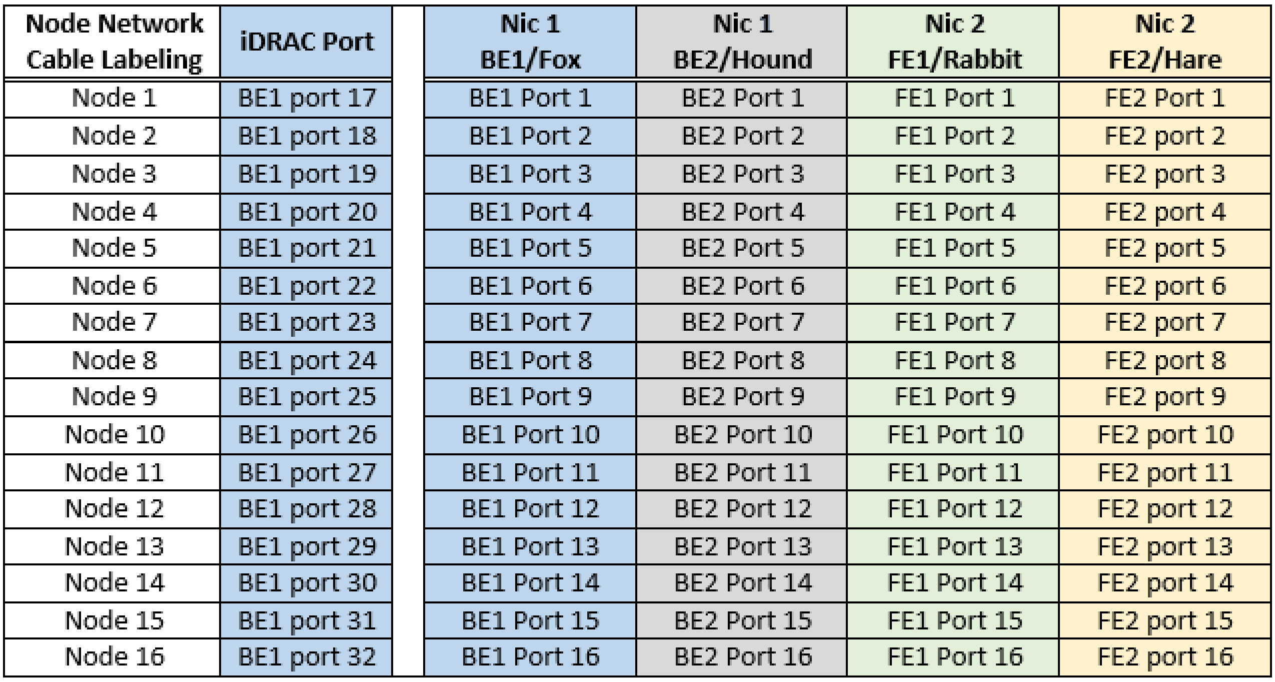
The EX300 node port to the iDRAC, back-end switch, and front-end switch port connections are listed in the following table.



Node Network Port Cabling	iDRAC Port	Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	Server 1 iDRAC	Server 1 BE1	Server 1 BE2	Server 1 FE1	Server 1 FE2
Node 2	Server 2 iDRAC	Server 2 BE1	Server 2 BE2	Server 2 FE1	Server 2 FE2
Node 3	Server 3 iDRAC	Server 3 BE1	Server 3 BE2	Server 3 FE1	Server 3 FE2
Node 4	Server 4 iDRAC	Server 4 BE1	Server 4 BE2	Server 4 FE1	Server 4 FE2
Node 5	Server 5 iDRAC	Server 5 BE1	Server 5 BE2	Server 5 FE1	Server 5 FE2
Node 6	Server 6 iDRAC	Server 6 BE1	Server 6 BE2	Server 6 FE1	Server 6 FE2
Node 7	Server 7 iDRAC	Server 7 BE1	Server 7 BE2	Server 7 FE1	Server 7 FE2
Node 8	Server 8 iDRAC	Server 8 BE1	Server 8 BE2	Server 8 FE1	Server 8 FE2
Node 9	Server 9 iDRAC	Server 9 BE1	Server 9 BE2	Server 9 FE1	Server 9 FE2
Node 10	Server 10 iDRAC	Server 10 BE1	Server 10 BE2	Server 10 FE1	Server 10 FE2
Node 11	Server 11 iDRAC	Server 11 BE1	Server 11 BE2	Server 11 FE1	Server 11 FE2
Node 12	Server 12 iDRAC	Server 12 BE1	Server 12 BE2	Server 12 FE1	Server 12 FE2
Node 13	Server 13 iDRAC	Server 13 BE1	Server 13 BE2	Server 13 FE1	Server 13 FE2
Node 14	Server 14 iDRAC	Server 14 BE1	Server 14 BE2	Server 14 FE1	Server 14 FE2
Node 15	Server 15 iDRAC	Server 15 BE1	Server 15 BE2	Server 15 FE1	Server 15 FE2
Node 16	Server 16 iDRAC	Server 16 BE1	Server 16 BE2	Server 16 FE1	Server 16 FE2

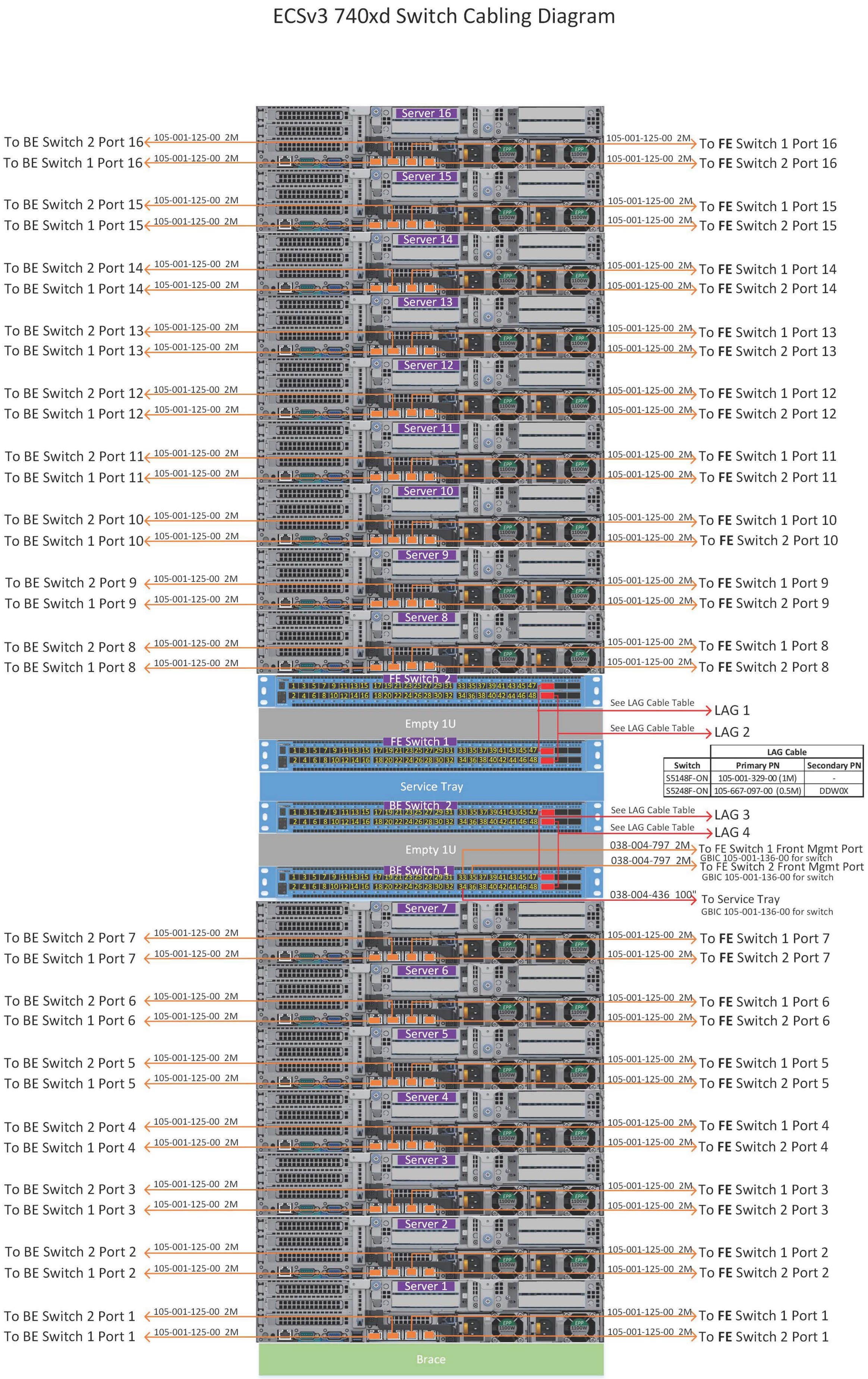
Figure 122. EX300 node network port cabling connections

The EX300 node network cable labeling is listed in the following table.



Node Network Cable Labeling	iDRAC Port		Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	BE1 port 17		BE1 Port 1	BE2 Port 1	FE1 Port 1	FE2 Port 1
Node 2	BE1 port 18		BE1 Port 2	BE2 Port 2	FE1 Port 2	FE2 port 2
Node 3	BE1 port 19		BE1 Port 3	BE2 Port 3	FE1 Port 3	FE2 port 3
Node 4	BE1 port 20		BE1 Port 4	BE2 Port 4	FE1 Port 4	FE2 port 4
Node 5	BE1 port 21		BE1 Port 5	BE2 Port 5	FE1 Port 5	FE2 port 5
Node 6	BE1 port 22		BE1 Port 6	BE2 Port 6	FE1 Port 6	FE2 port 6
Node 7	BE1 port 23		BE1 Port 7	BE2 Port 7	FE1 Port 7	FE2 port 7
Node 8	BE1 port 24		BE1 Port 8	BE2 Port 8	FE1 Port 8	FE2 port 8
Node 9	BE1 port 25		BE1 Port 9	BE2 Port 9	FE1 Port 9	FE2 port 9
Node 10	BE1 port 26		BE1 Port 10	BE2 Port 10	FE1 Port 10	FE2 port 10
Node 11	BE1 port 27		BE1 Port 11	BE2 Port 11	FE1 Port 11	FE2 port 11
Node 12	BE1 port 28		BE1 Port 12	BE2 Port 12	FE1 Port 12	FE2 port 12
Node 13	BE1 port 29		BE1 Port 13	BE2 Port 13	FE1 Port 13	FE2 port 13
Node 14	BE1 port 30		BE1 Port 14	BE2 Port 14	FE1 Port 14	FE2 port 14
Node 15	BE1 port 31		BE1 Port 15	BE2 Port 15	FE1 Port 15	FE2 port 15
Node 16	BE1 port 32		BE1 Port 16	BE2 Port 16	FE1 Port 16	FE2 port 16

Figure 123. EX300 node network cable labeling


ECSv3 740xd Switch Cabling Diagram
Server 16
To BE Switch 2 Port 16 105-001-125-00 2M
To BE Switch 1 Port 16 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 16
105-001-125-00 2M To FE Switch 2 Port 16
Server 15
To BE Switch 2 Port 15 105-001-125-00 2M
To BE Switch 1 Port 15 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 15
105-001-125-00 2M To FE Switch 2 Port 15
Server 14
To BE Switch 2 Port 14 105-001-125-00 2M
To BE Switch 1 Port 14 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 14
105-001-125-00 2M To FE Switch 2 Port 14
Server 13
To BE Switch 2 Port 13 105-001-125-00 2M
To BE Switch 1 Port 13 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 13
105-001-125-00 2M To FE Switch 2 Port 13
Server 12
To BE Switch 2 Port 12 105-001-125-00 2M
To BE Switch 1 Port 12 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 12
105-001-125-00 2M To FE Switch 2 Port 12
Server 11
To BE Switch 2 Port 11 105-001-125-00 2M
To BE Switch 1 Port 11 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 11
105-001-125-00 2M To FE Switch 2 Port 11
Server 10
To BE Switch 2 Port 10 105-001-125-00 2M
To BE Switch 1 Port 10 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 10
105-001-125-00 2M To FE Switch 2 Port 10
Server 9
To BE Switch 2 Port 9 105-001-125-00 2M
To BE Switch 1 Port 9 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 9
105-001-125-00 2M To FE Switch 2 Port 9
Server 8
To BE Switch 2 Port 8 105-001-125-00 2M
To BE Switch 1 Port 8 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 8
105-001-125-00 2M To FE Switch 2 Port 8
FE Switch 2
See LAG Cable Table LAG 1
Empty 1U
See LAG Cable Table LAG 2
FE Switch 1
Service Tray
BE Switch 2
See LAG Cable Table LAG 3
See LAG Cable Table LAG 4
Empty 1U
038-004-797 2M To FE Switch 1 Front Mgmt Port
GBIC 105-001-136-00 for switch
038-004-797 2M To FE Switch 2 Front Mgmt Port
GBIC 105-001-136-00 for switch
BE Switch 1
038-004-436 100" To Service Tray
GBIC 105-001-136-00 for switch
Server 7
To BE Switch 2 Port 7 105-001-125-00 2M
To BE Switch 1 Port 7 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 7
105-001-125-00 2M To FE Switch 2 Port 7
Server 6
To BE Switch 2 Port 6 105-001-125-00 2M
To BE Switch 1 Port 6 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 6
105-001-125-00 2M To FE Switch 2 Port 6
Server 5
To BE Switch 2 Port 5 105-001-125-00 2M
To BE Switch 1 Port 5 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 5
105-001-125-00 2M To FE Switch 2 Port 5
Server 4
To BE Switch 2 Port 4 105-001-125-00 2M
To BE Switch 1 Port 4 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 4
105-001-125-00 2M To FE Switch 2 Port 4
Server 3
To BE Switch 2 Port 3 105-001-125-00 2M
To BE Switch 1 Port 3 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 3
105-001-125-00 2M To FE Switch 2 Port 3
Server 2
To BE Switch 2 Port 2 105-001-125-00 2M
To BE Switch 1 Port 2 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 2
105-001-125-00 2M To FE Switch 2 Port 2
Server 1
To BE Switch 2 Port 1 105-001-125-00 2M
To BE Switch 1 Port 1 105-001-125-00 2M
105-001-125-00 2M To FE Switch 1 Port 1
105-001-125-00 2M To FE Switch 2 Port 1
Brace

	LAG Cable	
Switch	Primary PN	Secondary PN
S5148F-ON	105-001-329-00 (1M)	-
S5248F-ON	105-667-097-00 (0.5M)	DDW0X

Figure 124. EX300 network cabling

7

EX3000 Platform

Topics:

- EX3000 hardware components
- EX3000 configurations
- EX3000 upgrade paths
- EX3000 server
- EX3000 disk drives
- EX3000 power cabling
- EX3000 iDRAC cabling
- EX3000 network cabling

EX3000 hardware components

EX3000 S and D are offered in a Dell Technologies rack from the factory and in third-party rack. EX3000 nodes include the following hardware components.

Table 56. EX3000 hardware components

Component	Description
Customer-provided 40U rack	The requirements for customer-provided racks to accommodate the EX3000 nodes are described in the *ECS EX3000 Third-Party Rack Installation Guide*.
Back-end switches for private network connection	● Two Dell Technologies S5148F or S5248F 25 GbE 1U Ethernet switches with 48 x 25 GbE SFP ports. ● 2 x 100 GbE VLT cables per HA pair
Front-end switches for customer public network connection	● Two optional Dell Technologies S5148F or S5248F 25 GbE 1U Ethernet switches can be obtained for network connection or the customer can provide their own 25 GbE HA pair for the front end. ● If the customer provides their own front-end switches, they must supply all VLT cables, SFPs, or external connection cables. ● If Dell Technologies S5148F 25 GbE front-end switches are used, 25 GbE ports connect to the EX3000 nodes, and 2 GbE VLT cables are provided.
Nodes	● Up to eight server chassis in a rack. ● Chassis are in one and two-node configurations. (Each server chassis contains either one or two nodes.) One-node chassis configuration is called as EX3000S and dual-node chassis configuration is called as EX3000D. ● Chassis have the following disk configurations (all disks are 12 TB or16TB). ECS 3.5 and later supports 16 TB. (All drives sizes must be the same in the node): ○ EX3000S single node with 45, 60, and 90 disks ○ EX3000D dual node with 60 or 90 disks total (30 and 45 disks per node) ● You cannot mix EX3000S nodes and EX3000D dual-node chassis in both Dell Technologies and customer-provided rack. ● For chassis/node upgrades in the field, the nodes must match the existing drive configuration. (In a system with EX3000S nodes with 90 disk drives, you can only add EX3000S nodes configured with 90 disk drives. In a system with EX3000D nodes with 30 disk drives, you can only add EX3000D nodes configured with 30 disk drives (60 drives per chassis). ● EX3000S node has a single-server sled with the midplane routing to 90 drive slots. Filler is in the second server sled. ● EX3000D node has dual server sleds with the midplane routing each to 45 drive slots. ● Single 480 GB or 960 GB SSD sysdisk per node (hot swappable)

Table 56. EX3000 hardware components (continued)

Component	Description
	- 64 GB RAM per node - Dual 8-core Broadwell CPU per node. E5-2620v4 8-core/16-thread 2.1 GHz 20M cache 85 W - 4x 16 GB RDIMM, 2400MT/s, Dual Rank, x8 Data Width - EX3000S has 2 x 1600 W power supplies (hot swappable). EX3000D has 4 x 1100 W power supplies (hot swappable). - LSI 9361-8i SAS Controller - Each node has 4 x 25 GbE networking

EX3000 configurations

Describes the EX3000 ECS appliance configurations.

The front views of an EX3000S appliance and an EX3000D appliance in both DellEMC and customer-provided racks with the minimum and maximum node configurations are shown in the following diagrams.

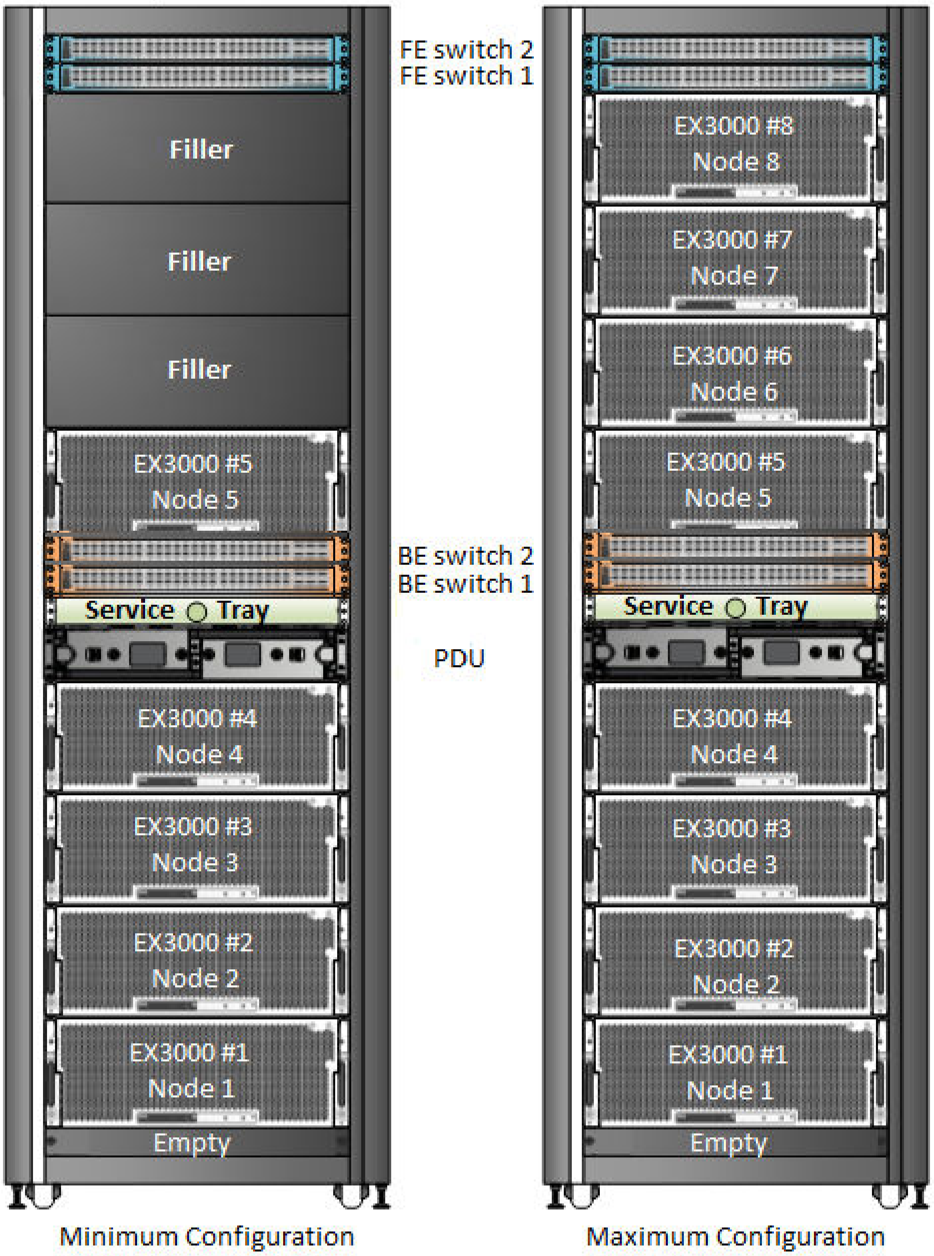

FE switch 2
FE switch 1
Filler
Filler
Filler
EX3000 #5
Node 5
BE switch 2
BE switch 1
Service Tray
PDU
EX3000 #4
Node 4
EX3000 #3
Node 3
EX3000 #2
Node 2
EX3000 #1
Node 1
Empty
Minimum Configuration
EX3000 #8
Node 8
EX3000 #7
Node 7
EX3000 #6
Node 6
EX3000 #5
Node 5
Service Tray
EX3000 #4
Node 4
EX3000 #3
Node 3
EX3000 #2
Node 2
EX3000 #1
Node 1
Empty
Maximum Configuration

Figure 125. EX3000S minimum and maximum configurations for single node chassis

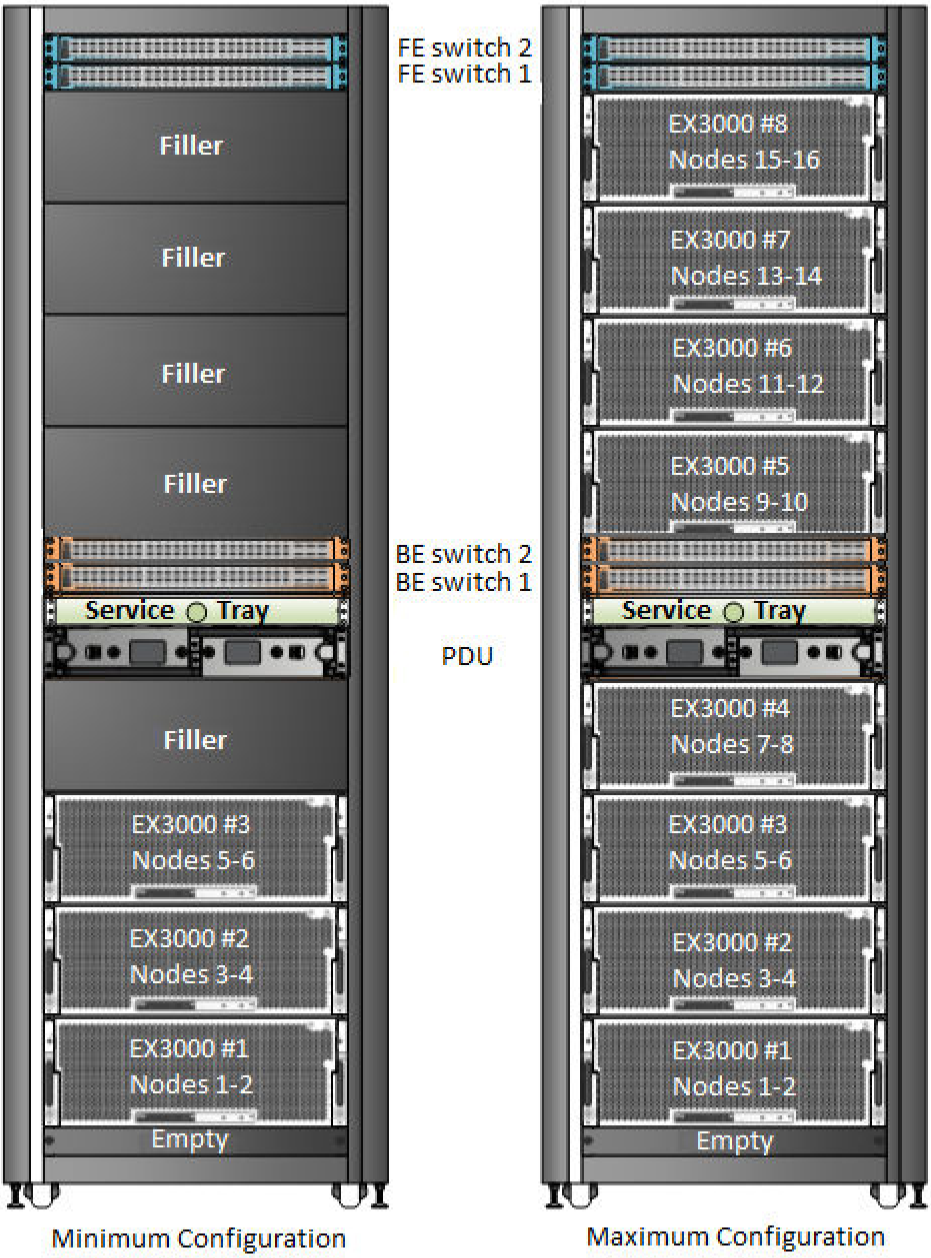

FE switch 2
FE switch 1
Filler
Filler
Filler
Filler
BE switch 2
BE switch 1
Service ○ Tray
PDU
Filler
EX3000 #3 Nodes 5-6
EX3000 #2 Nodes 3-4
EX3000 #1 Nodes 1-2
Empty
EX3000 #8 Nodes 15-16
EX3000 #7 Nodes 13-14
EX3000 #6 Nodes 11-12
EX3000 #5 Nodes 9-10
Service ○ Tray
EX3000 #4 Nodes 7-8
EX3000 #3 Nodes 5-6
EX3000 #2 Nodes 3-4
EX3000 #1 Nodes 1-2
Empty
Minimum Configuration
Maximum Configuration

Figure 126. EX3000D minimum and maximum configurations for dual node chassis

There are five SKUs of EX3000 nodes that all have the same configuration except for their drive load and number of nodes.

- EX3000S single node with 45, 60, or 90 12 TB or 16 TB HDDs
- EX3000D dual nodes with 60 or 90 12 TB or 16 TB HDDs total

EX3000S and EX3000D chassis cannot be mixed within a customer-provided rack.

The EX3000 appliance is available in the following configurations in both DellEMC and customer-provided rack.

Table 57. EX3000S single node chassis configurations

Nodes	Disks in each node	Disk size	RAW storage capacity
5 (minimum configuration)	• 45 • 60 • 90	12 TB	• 2.7 PB • 3.6 PB • 5.4 PB
5	• 45	16 TB	• 3.6 PB

Table 57. EX3000S single node chassis configurations (continued)

Nodes	Disks in each node	Disk size	RAW storage capacity
	60 90		4.8 PB 7.2 PB
6	45 60 90	12 TB	3.24 PB 4.32 PB 6.48 PB
6	45 60 90	16 TB	4.32 PB 5.76 PB 8.64 PB
7	45 60 90	12 TB	3.78 PB 5.04 PB 7.56 PB
7	45 60 90	16 TB	5.04 PB 6.72 PB 10.08 PB
8 (maximum configuration)	45 60 90	12 TB	4.32 PB 5.76 PB 8.64 PB
8	45 60 90	16 TB	5.76 PB 7.68 PB 11.52 PB

Table 58. EX3000D dual node chassis configurations

Nodes	Disks in each node	Disk Size	RAW Storage capacity
6 (minimum configuration)	30 45	12 TB	2.16 PB 3.24 PB
6	30 45	16 TB	2.88 PB 4.32 PB
8	30 45	12 TB	2.88 PB 4.32 PB
8	30 45	16 TB	3.84 PB 5.76 PB
10	30 45	12 TB	3.60 PB 5.40 PB
10	30 45	16 TB	4.8 PB 7.2 PB
12	30 45	12 TB	4.32 PB 6.48 PB
12	30 45	16 TB	5.76 PB 8.64 PB
14	30 45	12 TB	5.04 PB 7.56 PB
14	30 45	16 TB	6.72 PB 10.08 PB
15	30 45	12 TB	5.76 PB 8.64 PB

Table 58. EX3000D dual node chassis configurations (continued)

Nodes	Disks in each node	Disk Size	RAW Storage capacity
16 (maximum configuration)	● 30 ● 45	16 TB	● 7.68 PB ● 11.52 PB

EX3000 upgrade paths

Describes the EX3000 ECS appliance upgrade paths.

If there are five or more nodes (single node configurations) or six or more nodes (dual node configurations) in the system (VDC) with the same disk size and disk quantity, the minimum node expansion is one (single node configurations) or 2 (dual node configurations). This upgrade is possible when the expansion node has the same disk size and disk quantity of the existing nodes. For example, you have an EX3000 appliance with five nodes containing 45x12TB disks (540 TB). You can add a single node with 45x12TB disks or a total disk capacity of 540 TB.

If you are adding nodes that have different disk sizes than the nodes currently in the system, you must add a minimum of five nodes at a time (six for dual node configurations). For example, you have an EX3000 appliance with five nodes containing 45x12TB drives. If you want to add nodes of different drive size (16 TB), you must add five or more nodes (six or more nodes for dual node configurations), at a time.

NOTE: All drives within a node must be of the same drive size, but there can be nodes of differing drive sizes within a rack.

You can add drives to partially populated EX3000 nodes. The following drive upgrades are supported:

- Convert EX3000S-45 to EX3000S-60.
- Convert EX3000S-60 to EX3000S-90.
- Convert EX3000D-30 to EX3000D-45.

EX3000 server

This topic describes the features of EX3000 server.

The EX3000 4U server contains the EX3000 chassis and either one server sled (in the EX3000S single node configuration) or two server sleds (in the EX3000D dual node configuration). EX3000 servers have the following standard features:

- One-node or two-node servers (4U) with two CPUs per node
- Dual 8-core Broadwell CPU per node. E5-2620v4 8-core/16-thread 2.1 GHz 20M cache 85 W
- 4x16GB RDIMM, 2400MT/s, Dual Rank, x8 Data Width
- One system disk per node (480 GB or 960 GB SSD)
- LED indicators for each node
- Dual hot-swap chassis power supplies per node
- One SAS adapter with two SAS ports per node

The EX3000 physical dimensions are listed in the following table.

Table 59. EX3000 physical dimensions

Height	173.8 mm (6.84 in.)
Width with rack latches	482.4 mm (18.99 in.)
Width without rack latches	448.0 mm (17.64 in.)
Depth	1,098.4 mm (43.24 in.)
Total depth of system with cable management (CMA) arm attached	1,242.68 mm (48.92 in.)
Weight (maximum)	134.0 kg (295.42 lb)
Weight (empty)	57.1 kg (125.88 lb)

Server front view

This topic illustrates the front view of EX3000 server.

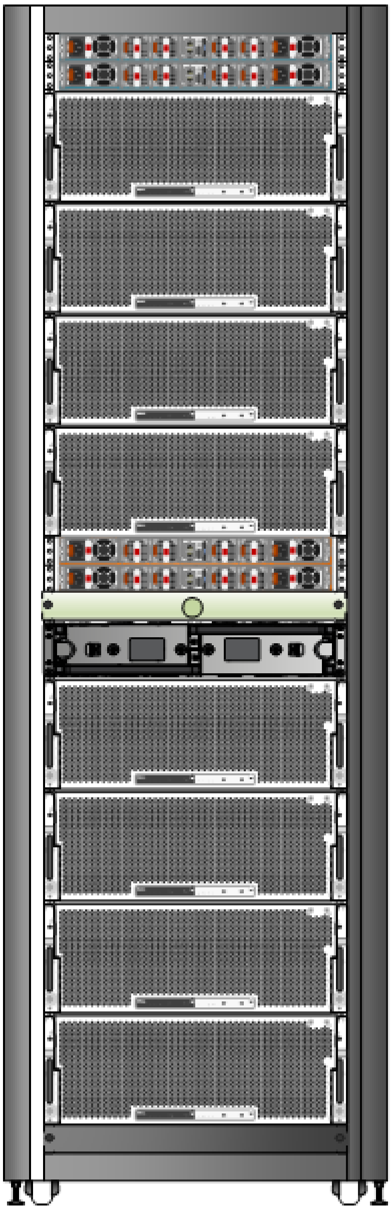


Figure 127. EX3000 server front view in rack

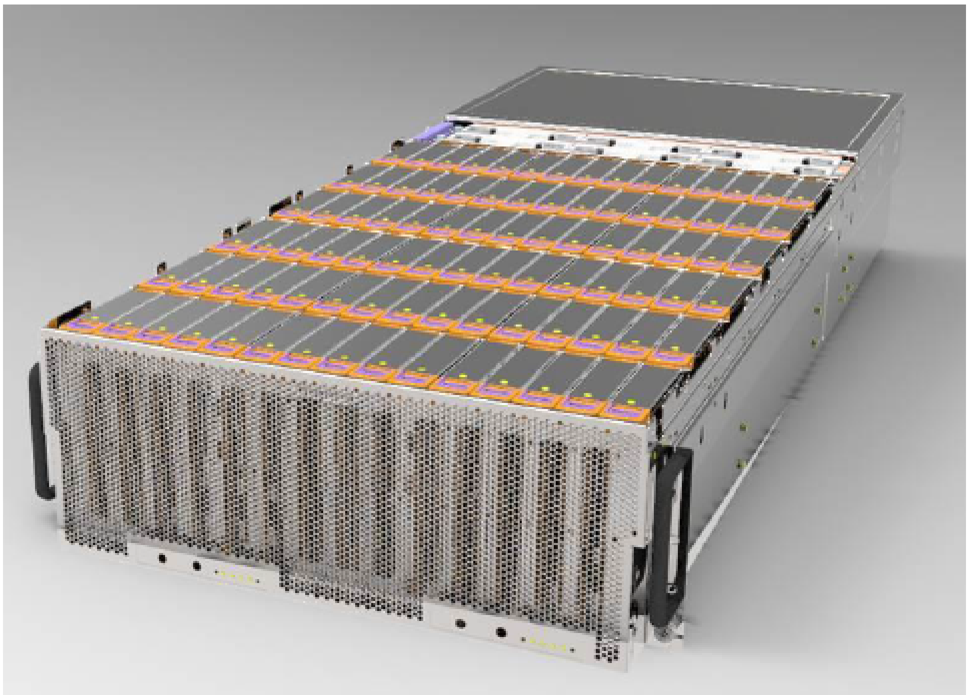


Figure 128. EX3000 external chassis view

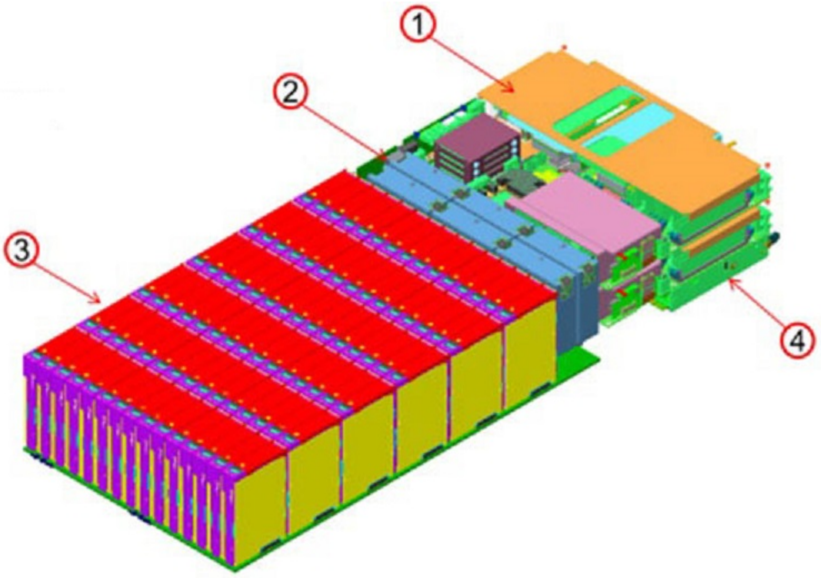


Figure 129. EX3000 internal chassis view

1. Server sled (one or two depending on whether the EX3000 system is single- or dual-node chassis configuration)
2. Fan module (6)
3. 3.5-inch HDDs (up to 90)
4. PSU unit (2 for an EX3000S single node and 4 for an EX3000D dual node)

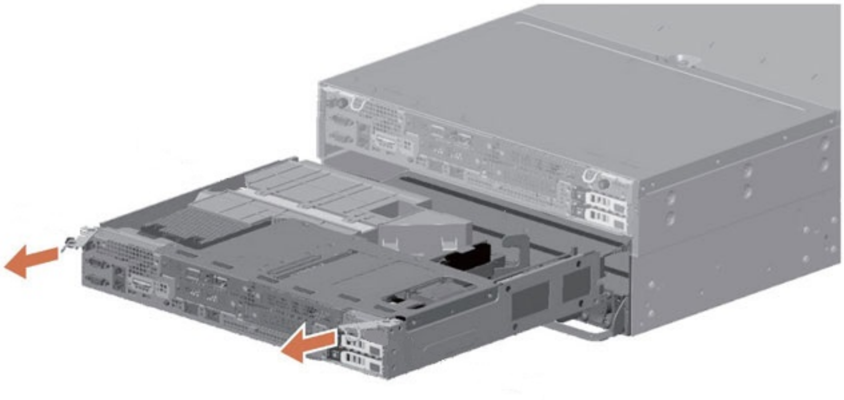


Figure 130. External view of server sled A in a EX3000D dual node chassis with two sleds

For the EX3000S single-node system, a dummy sled is installed over the bottom sled A compartment and there are air flow covers over the two empty power supply slots.

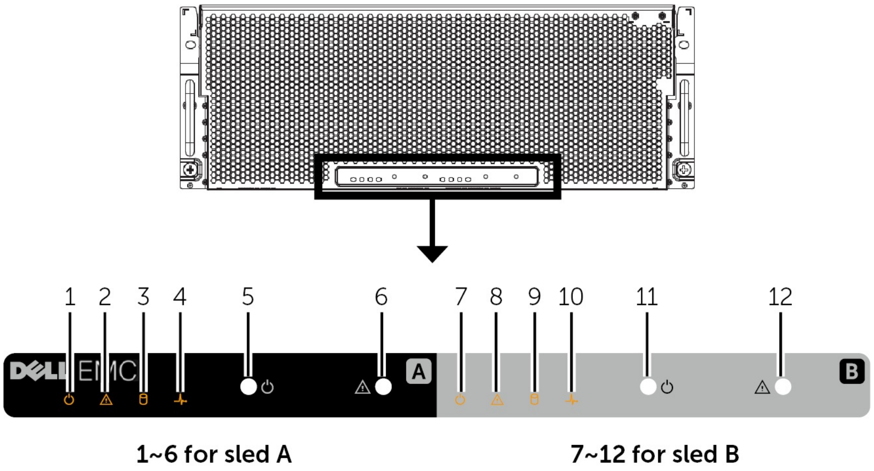


Figure 131. Front-panel features and indicators

Table 60. Server indicators, buttons, or connectors

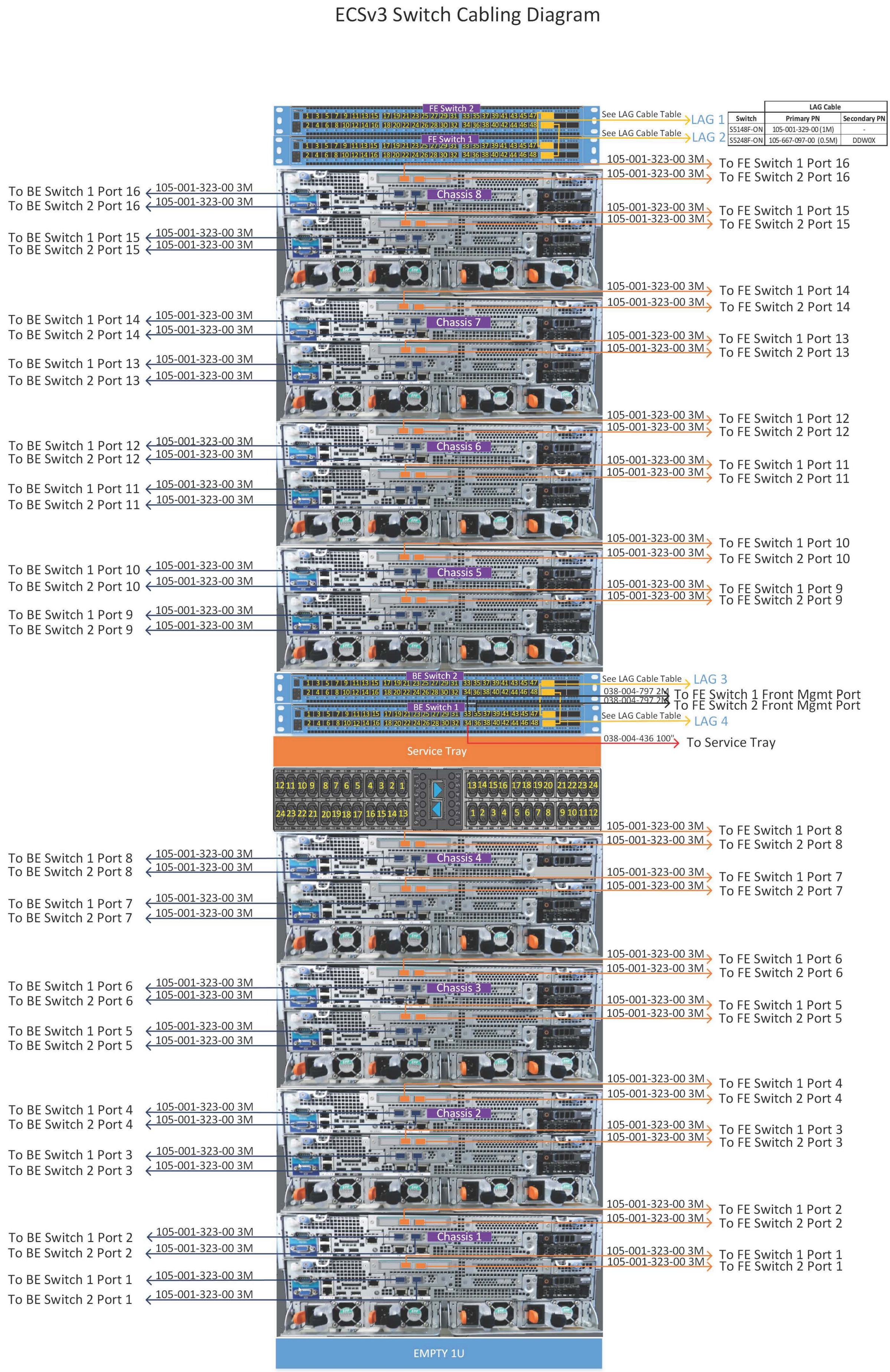
Item	Indicator, Button, or Connector	Description
1	Power indicator	The power indicator glows when the system is turned on.
2	ID indicator	When a system identification button is pressed, the ID indicator blinks blue to help locate a particular system within a rack.
3	Sled	A hard drive fault status indicator. The indicator blinks amber if a hard drive experiences an issue.
4	System board status indicator	If the system is on, and in good health, the indicator glows solid blue. The indicator blinks amber if the system is in standby, and if any issue exists (for example, a failed fan or hard drive).
5	Power button	● The power button controls the PSU output to the system. ● **NOTE:** On ACPI-compliant operating systems (OSs), turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.
6	System identification button	● The identification button can be used to locate a particular system within a rack. ● Press to switch the system ID on and off. ● If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode.

Table 60. Server indicators, buttons, or connectors (continued)

Item	Indicator, Button, or Connector	Description
		• To reset iDRAC (if not disabled in F2 iDRAC setup) press and hold the button for more than 15 seconds.
7	Power indicator	The power indicator glows when the system is turned on.
8	ID indicator	When a system identification button is pressed, the ID indicator blinks blue to help locate a particular system within a rack.
9	Sled B hard drive fault status indicator	• The indicator blinks amber if a hard drive experiences an issue. • **NOTE:** Features of Sled B are for dual-node systems only.
10	System board status indicator	If the system is on, and in good health, the indicator glows solid blue. The indicator blinks amber if the system is in standby, and if any issue exists (for example, a failed fan or hard drive).
11	Power button	• The power button controls the PSU output to the system. • **NOTE:** On ACPI-compliant operating systems (OSs), turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.
12	System identification button	• The identification button can be used to locate a particular system within a rack. • Press to switch the system ID on and off. • If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode. • To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.

Server rear view

This topic illustrates the rear view of EX3000 server.


ECSv3 Switch Cabling Diagram
FE Switch 2
FE Switch 1
See LAG Cable Table
LAG 1
See LAG Cable Table
LAG 2
105-001-323-00 3M
To FE Switch 1 Port 16
105-001-323-00 3M
To FE Switch 2 Port 16
To BE Switch 1 Port 16
105-001-323-00 3M
To BE Switch 2 Port 16
105-001-323-00 3M
Chassis 8
105-001-323-00 3M
To FE Switch 1 Port 15
105-001-323-00 3M
To FE Switch 2 Port 15
To BE Switch 1 Port 15
105-001-323-00 3M
To BE Switch 2 Port 15
105-001-323-00 3M
105-001-323-00 3M
To FE Switch 1 Port 14
105-001-323-00 3M
To FE Switch 2 Port 14
To BE Switch 1 Port 14
105-001-323-00 3M
To BE Switch 2 Port 14
105-001-323-00 3M
Chassis 7
105-001-323-00 3M
To FE Switch 1 Port 13
105-001-323-00 3M
To FE Switch 2 Port 13
To BE Switch 1 Port 13
105-001-323-00 3M
To BE Switch 2 Port 13
105-001-323-00 3M
105-001-323-00 3M
To FE Switch 1 Port 12
105-001-323-00 3M
To FE Switch 2 Port 12
To BE Switch 1 Port 12
105-001-323-00 3M
To BE Switch 2 Port 12
105-001-323-00 3M
Chassis 6
105-001-323-00 3M
To FE Switch 1 Port 11
105-001-323-00 3M
To FE Switch 2 Port 11
To BE Switch 1 Port 11
105-001-323-00 3M
To BE Switch 2 Port 11
105-001-323-00 3M
105-001-323-00 3M
To FE Switch 1 Port 10
105-001-323-00 3M
To FE Switch 2 Port 10
To BE Switch 1 Port 10
105-001-323-00 3M
To BE Switch 2 Port 10
105-001-323-00 3M
Chassis 5
105-001-323-00 3M
To FE Switch 1 Port 9
105-001-323-00 3M
To FE Switch 2 Port 9
To BE Switch 1 Port 9
105-001-323-00 3M
To BE Switch 2 Port 9
105-001-323-00 3M
BE Switch 2
BE Switch 1
See LAG Cable Table
LAG 3
038-004-797 2M
To FE Switch 1 Front Mgmt Port
038-004-797 2M
To FE Switch 2 Front Mgmt Port
See LAG Cable Table
LAG 4
038-004-436 100"
To Service Tray
Service Tray
12 11 10 9 8 7 6 5 4 3 2 1
13 14 15 16 17 18 19 20 21 22 23 24
24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
105-001-323-00 3M
To FE Switch 1 Port 8
105-001-323-00 3M
To FE Switch 2 Port 8
To BE Switch 1 Port 8
105-001-323-00 3M
To BE Switch 2 Port 8
105-001-323-00 3M
Chassis 4
105-001-323-00 3M
To FE Switch 1 Port 7
105-001-323-00 3M
To FE Switch 2 Port 7
To BE Switch 1 Port 7
105-001-323-00 3M
To BE Switch 2 Port 7
105-001-323-00 3M
105-001-323-00 3M
To FE Switch 1 Port 6
105-001-323-00 3M
To FE Switch 2 Port 6
To BE Switch 1 Port 6
105-001-323-00 3M
To BE Switch 2 Port 6
105-001-323-00 3M
Chassis 3
105-001-323-00 3M
To FE Switch 1 Port 5
105-001-323-00 3M
To FE Switch 2 Port 5
To BE Switch 1 Port 5
105-001-323-00 3M
To BE Switch 2 Port 5
105-001-323-00 3M
105-001-323-00 3M
To FE Switch 1 Port 4
105-001-323-00 3M
To FE Switch 2 Port 4
To BE Switch 1 Port 4
105-001-323-00 3M
To BE Switch 2 Port 4
105-001-323-00 3M
Chassis 2
105-001-323-00 3M
To FE Switch 1 Port 3
105-001-323-00 3M
To FE Switch 2 Port 3
To BE Switch 1 Port 3
105-001-323-00 3M
To BE Switch 2 Port 3
105-001-323-00 3M
105-001-323-00 3M
To FE Switch 1 Port 2
105-001-323-00 3M
To FE Switch 2 Port 2
To BE Switch 1 Port 2
105-001-323-00 3M
To BE Switch 2 Port 2
105-001-323-00 3M
Chassis 1
105-001-323-00 3M
To FE Switch 1 Port 1
105-001-323-00 3M
To FE Switch 2 Port 1
To BE Switch 1 Port 1
105-001-323-00 3M
To BE Switch 2 Port 1
105-001-323-00 3M
EMPTY 1U

	LAG Cable	
Switch	Primary PN	Secondary PN
S5148F-ON	105-001-329-00 (1M)	-
S5248F-ON	105-667-097-00 (0.5M)	DDW0X

Figure 132. EX3000D server rear view in rack

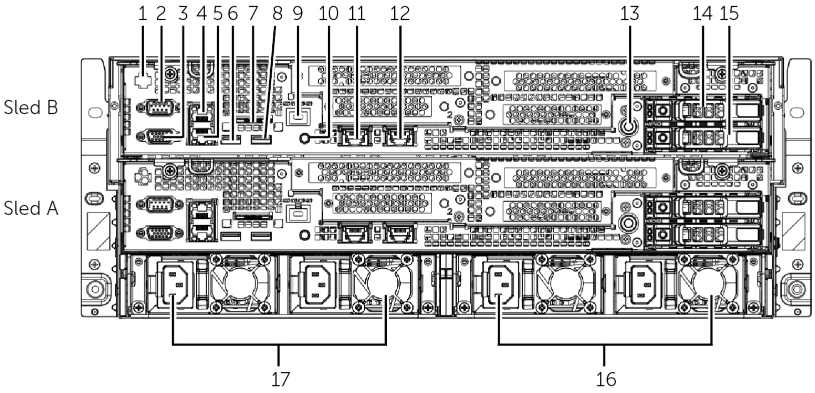


Figure 133. Back-panel features and indicators

NOTE: Items numbers 4, 5, 7, 11, 12, and 15 are not in use on EX3000.

Table 61. Server indicators, buttons, or connectors

Item	Indicator, Button, or Connector	Description
1	Blade EN connector (optional)	This function is reserved.
2	Serial connector	This connector enables you to connect a serial device to the system.
3	Video connector	This connector enables you to connect a VGA display to the system.
4	Ethernet connector 1	Integrated 10/100/1000 Mbps NIC connector.
5	Ethernet connector 2	Integrated 10/100/1000 Mbps NIC connector.
6	USB connector	Enables you to connect USB devices to the system. The port is USB 2.0-compliant.
7	SD vFlash card slot	Provides persistent on-demand local storage and a custom deployment environment that allows automation of server configuration, scripts, and imaging. For more information, see the Integrated Dell Remote Access Controller 9 (iDRAC9) User's Guide.
8	USB connector	Enables you to connect USB devices to the system. The port is USB 3.0-compliant.
9	Dedicated Ethernet port	This is a dedicated management port on the iDRAC ports card.
10	System identification button	● The identification button can be used to locate a particular system within a rack. ● Press to switch the system ID on and off. ● If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode. ● To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.
11	Ethernet connector 3	Integrated 10/100/1000 Mbps NIC connector.
12	Ethernet connector 4	Integrated 10/100/1000 Mbps NIC connector.
13	Power button	● The power button controls the PSU output to the system. ● **NOTE:** On ACPI-compliant operating systems (OSs), turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.
14	Boot SSD	2.5-inch boot SSD
15	SSD in rear slots	Optional 960 GB SATA MU SSD read cache. ● This feature is optional and available only with 3.5 and above. For more information, see *ECS Appliance SSD Read Cache Deployment guide*.

Table 61. Server indicators, buttons, or connectors (continued)

Item	Indicator, Button, or Connector	Description
16	Power supply units	These are two redundant power supply units (PSUs) for sled A.
17	Power supply units	These are two redundant power supply units (PSUs) for sled B.

NOTE:

- Features of sled B are for EX3000D dual-node systems only.
- A dummy sled (sled B) is installed over the sled A compartment and two dummy PSUs over the PSU slots for sled B in the EX3000S single-node system.

EX3000 disk drives

This section describes the disk drives that are integrated into the server chassis of the EX3000 appliance.

The EX3000 4U chassis contains one or two server sleds, depending on whether the chassis is a single or dual node configuration. Both chassis configurations support the 12 TB 3.5" 6 Gb/s SATA 512e and 16 TB SATA 512e disk drives.

In EX3000 single node chassis configurations, there can be 45, 60, or 90 12 TB or 16 TB drives per node. In EX3000 dual node chassis configurations, there can be 30 or 45 12 TB or 16 TB drives per node (60 or 90 drives per chassis). Drives are drawer accessible and hot-pluggable. There is a 2.5" S4510 960GB SSD in each EX3000 node for the operating system. You cannot mix single and dual node chassis within the same rack.

NOTE: The 480 GB drive is going end of life in the Dell ordering system and is replaced with S4510 960GB SSD.

NOTE: EX3000 and EX300 drive carriers are not compatible.

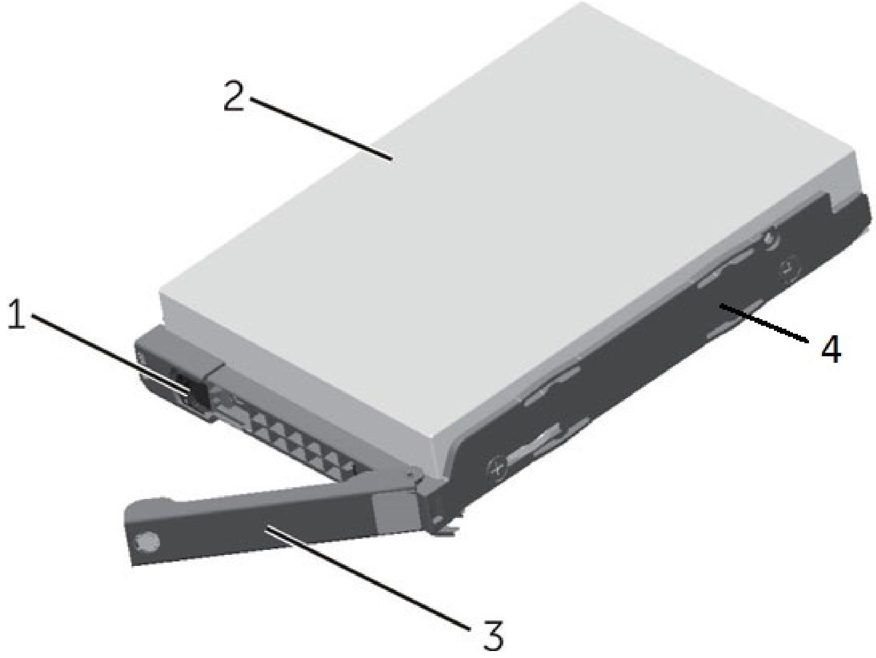


Figure 134. EX3000 disk drive in carrier

1 - Release button

2 - 3.5-inch hard drive

3 - hard drive carrier handle

4 - hard drive carrier

EX3000 power cabling

Provides EX3000S and EX3000D ECS appliance cabling diagrams for single-phase AC power and three-phase delta and wye AC power.

Use the power and weight calculator to refine the power and heat values to more-closely match the hardware configuration for your system. The calculator contains the latest information for power and weight planning.

The following diagram shows the PDU outlet numbers for Zone A and Zone B.

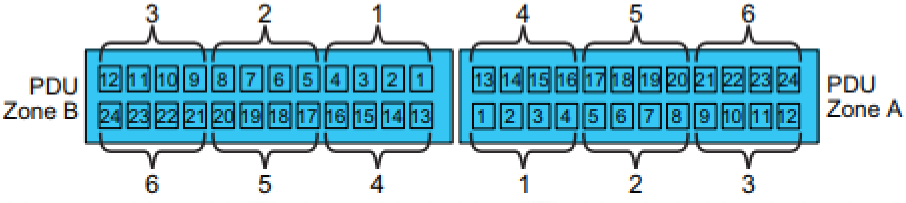


Figure 135. PDU outlet numbers

The EX3000S and EX3000D appliance connections to PDU outlets are listed in the following tables.

Table 62. EX3000S PDU cabling

PDU cabling	Node A - PS1 outlet numbers	Node A - PS2 outlet numbers	Switch PS2 outlet numbers	Switch PS1 outlet numbers	Line cord number per zone (single phase)
	Zone B	**Zone A**	**Zone B**	**Zone A**	
	Black cables	**Gray cables**	**Black cables**	**Gray cables**	
FE 2	-	-	13	13	1
FE 1	-	-	1	1	1
Chassis 8	22	22	-	-	3
Chassis 7	11	11	-	-	3
Chassis 6	9	9	-	-	3
Chassis 5	18	18	-	-	2
BE 2	-	-	14	14	1
BE 1	-	-	2	2	1
Service tray	8	-	-	-	2
Light Bar	-	20	-	-	2
Chassis 4	7	7	-	-	2
Chassis 3	5	5	-	-	2
Chassis 2	15	15	-	-	1
Chassis 1	3	3	-	-	1

Table 63. EX3000D PDU cabling

PDU cabling	Node B - PS1 outlet numbers	Node B - PS2 outlet numbers	Node A - PS1 outlet numbers	Node A - PS2 outlet numbers	Switch PS2 outlet numbers	Switch PS1 outlet numbers	Line cord number per zone (single phase)
	Zone B	**Zone A**	**Zone B**	**Zone A**	**Zone B**	**Zone A**	
	Black cables	**Gray cables**	**Black cables**	**Gray cables**	**Black cables**	**Gray cables**	
FE 2	-	-	-	-	13	13	1
FE 1	-	-	-	-	1	1	1

Table 63. EX3000D PDU cabling (continued)

PDU cabling	Node B - PS1 outlet numbers	Node B - PS2 outlet numbers	Node A - PS1 outlet numbers	Node A - PS2 outlet numbers	Switch PS2 outlet numbers	Switch PS1 outlet numbers	Line cord number per zone (single phase)
	Zone B	**Zone A**	**Zone B**	**Zone A**	**Zone B**	**Zone A**	
	Black cables	**Gray cables**	**Black cables**	**Gray cables**	**Black cables**	**Gray cables**	
Chassis 8	22	23	23	22	-	-	3
Chassis 7	11	21	21	11	-	-	3
Chassis 6	9	10	10	9	-	-	3
Chassis 5	18	19	19	18	-	-	2
BE 2	-	-	-	-	14	14	1
BE 1	-	-	-	-	2	2	1
Service tray	8	-	-	-	-	-	2
Light Bar		20	-	-	-	-	2
Chassis 4	7	17	17	7	-	-	2
Chassis 3	5	6	6	5	-	-	2
Chassis 2	15	16	16	15	-	-	1
Chassis 1	3	4	4	3	-	-	1

Single-phase AC power cabling

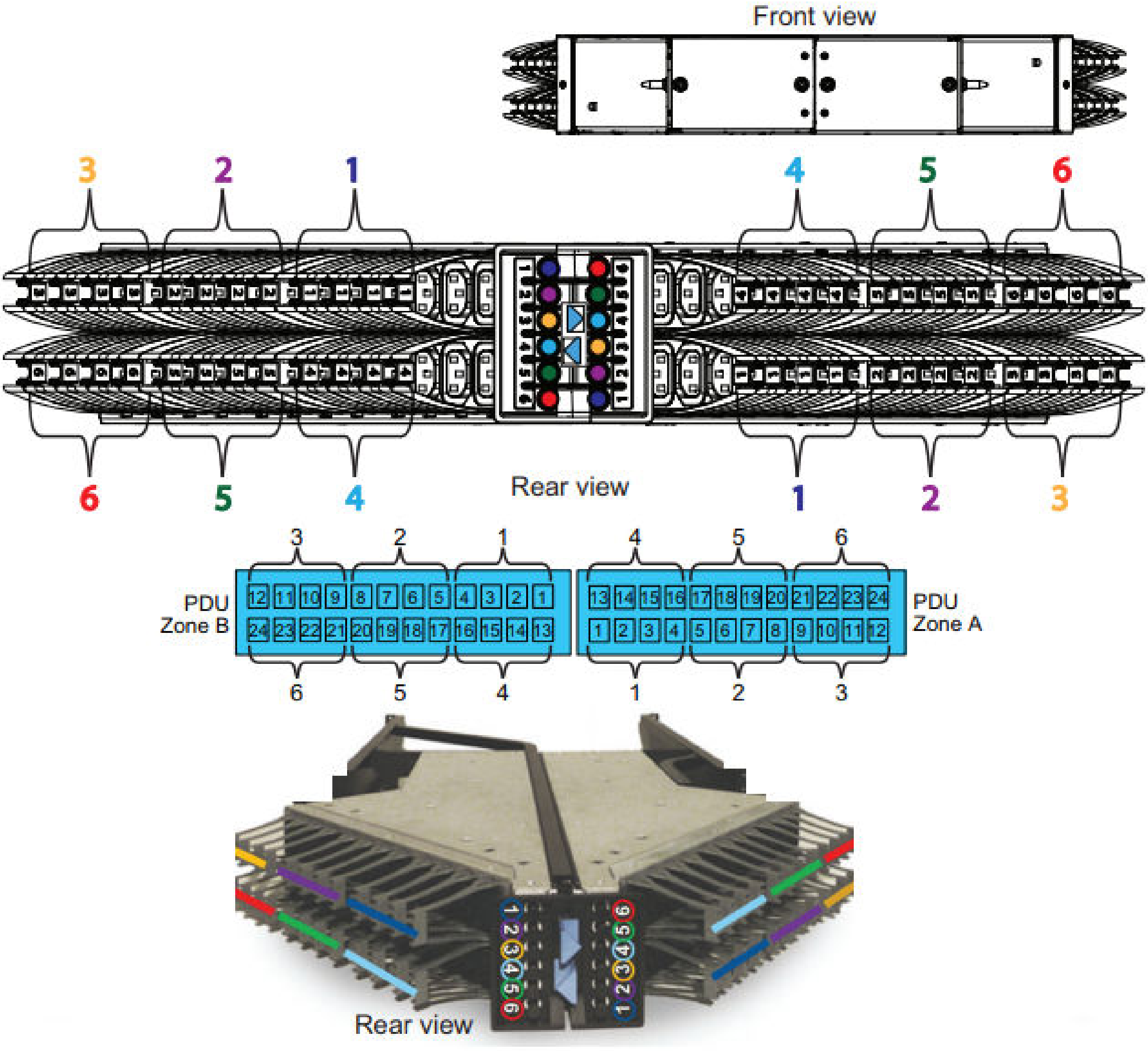

Front view
3
2
1
4
5
6
6
5
4
Rear view
1
2
3
PDU Zone B
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
PDU Zone A
Rear view

Figure 136. PDU single-phase diagram

Each EX3000 install kit contains 93" black and gray power cables and 118" gray and black power cables. The 93'' and 118" cords are sent with third party and Dell Technologies expansion nodes. However, Dell Technologies racks are shipped from the factory with 93" AC cables. You should only use the appropriate length cable per the cabinet position being installed as shown in the following diagrams. EX3000 systems shipped for a third-party rack require the extra 118" cables while Dell Technologies racks only need the 93" cables. After you complete the power cabling for the EX3000 appliance, you will always have an extra pair of unused power cables. In the following diagram, the switches plug into the front of the rack and route through the rails to the rear.

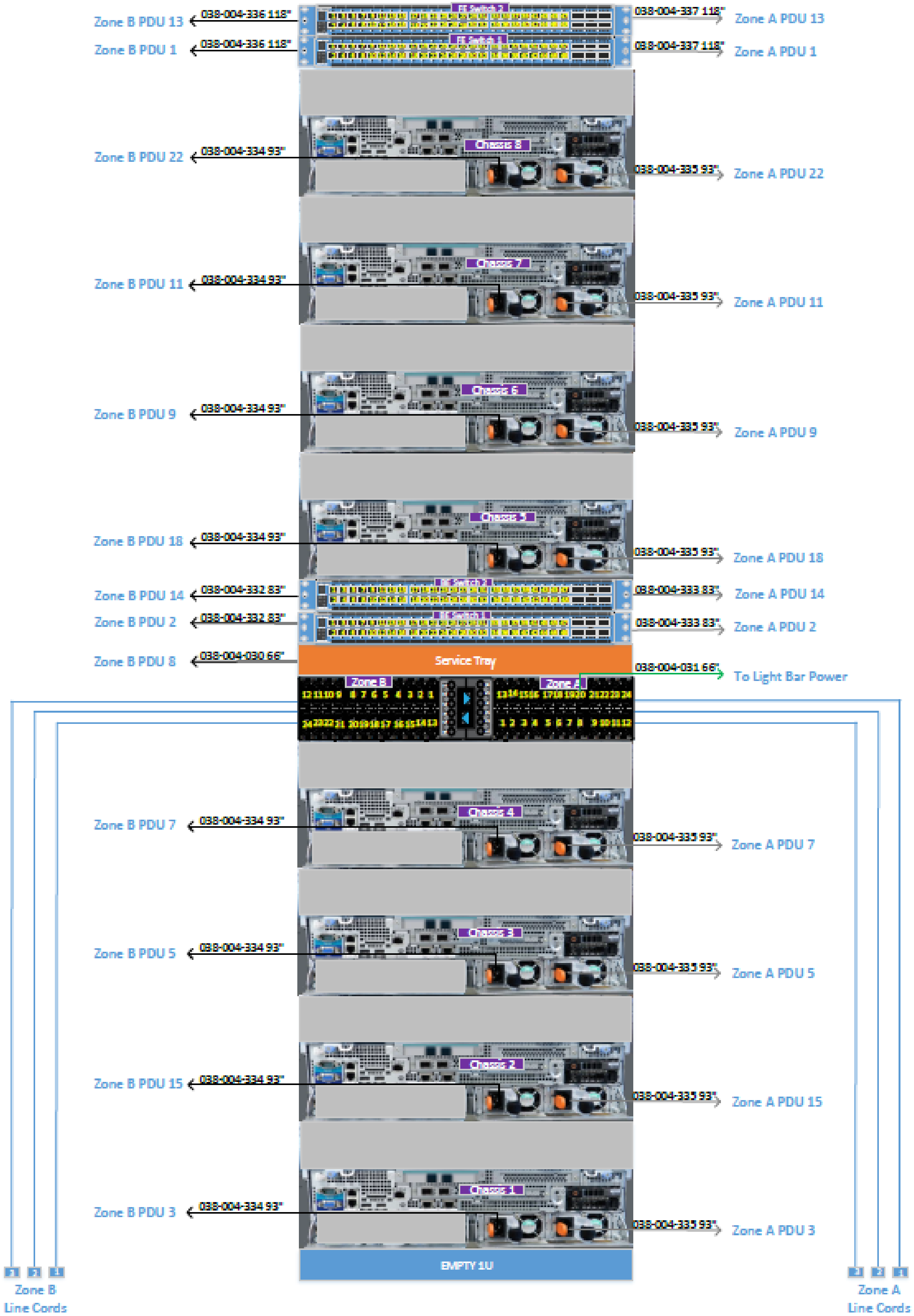

Zone B PDU 13
038-004-336 118"
FE Switch 2
038-004-337 118"
Zone A PDU 13
Zone B PDU 1
038-004-336 118"
FE Switch 1
038-004-337 118"
Zone A PDU 1
Zone B PDU 22
038-004-334 93"
Chassis 8
038-004-335 93"
Zone A PDU 22
Zone B PDU 11
038-004-334 93"
Chassis 7
038-004-335 93"
Zone A PDU 11
Zone B PDU 9
038-004-334 93"
Chassis 6
038-004-335 93"
Zone A PDU 9
Zone B PDU 18
038-004-334 93"
Chassis 5
038-004-335 93"
Zone A PDU 18
Zone B PDU 14
038-004-332 83"
038-004-333 83"
Zone A PDU 14
Zone B PDU 2
038-004-332 83"
038-004-333 83"
Zone A PDU 2
Zone B PDU 8
038-004-030 66"
Service Tray
038-004-031 66"
To Light Bar Power
Zone B
Zone A
Zone B PDU 7
038-004-334 93"
Chassis 4
038-004-335 93"
Zone A PDU 7
Zone B PDU 5
038-004-334 93"
Chassis 3
038-004-335 93"
Zone A PDU 5
Zone B PDU 15
038-004-334 93"
Chassis 2
038-004-335 93"
Zone A PDU 15
Zone B PDU 3
038-004-334 93"
Chassis 1
038-004-335 93"
Zone A PDU 3
EMPTY 1U
Zone B
Line Cords
Zone A
Line Cords

Figure 137. EX3000S single-phase AC power cabling

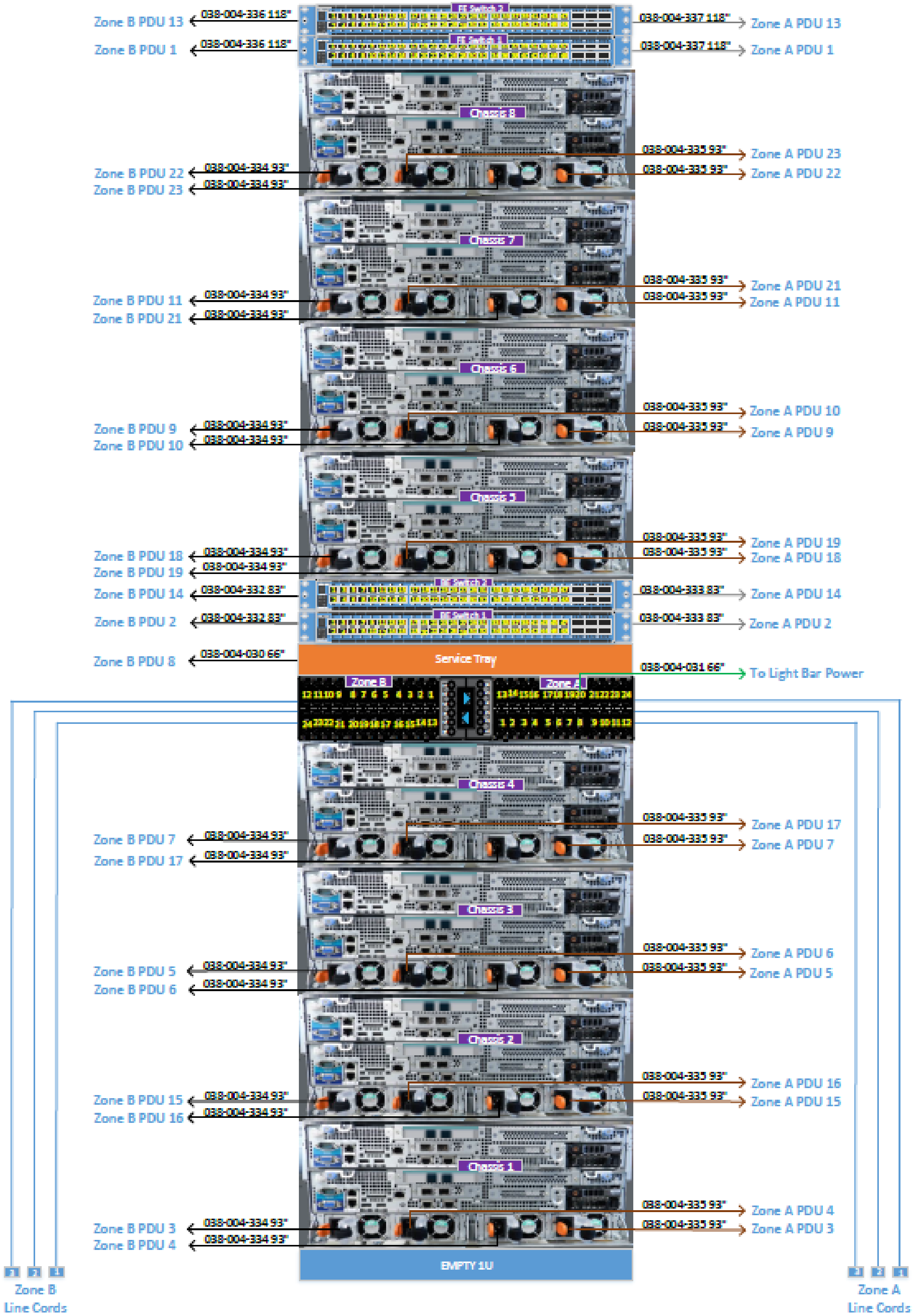

Zone B PDU 13
038-004-336 118"
FE Switch 2
038-004-337 118"
Zone A PDU 13
Zone B PDU 1
038-004-336 118"
FE Switch 1
038-004-337 118"
Zone A PDU 1
Chassis 8
038-004-335 93"
Zone A PDU 23
038-004-335 93"
Zone A PDU 22
Zone B PDU 22
038-004-334 93"
Zone B PDU 23
038-004-334 93"
Chassis 7
038-004-335 93"
Zone A PDU 21
038-004-335 93"
Zone A PDU 11
Zone B PDU 11
038-004-334 93"
Zone B PDU 21
038-004-334 93"
Chassis 6
038-004-335 93"
Zone A PDU 10
038-004-335 93"
Zone A PDU 9
Zone B PDU 9
038-004-334 93"
Zone B PDU 10
038-004-334 93"
Chassis 5
038-004-335 93"
Zone A PDU 19
038-004-335 93"
Zone A PDU 18
Zone B PDU 18
038-004-334 93"
Zone B PDU 19
038-004-334 93"
Zone B PDU 14
038-004-332 83"
IB Switch 2
038-004-333 83"
Zone A PDU 14
Zone B PDU 2
038-004-332 83"
IB Switch 1
038-004-333 83"
Zone A PDU 2
Zone B PDU 8
038-004-030 66"
Service Tray
038-004-031 66"
To Light Bar Power
Zone B
Zone A
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
Chassis 4
038-004-335 93"
Zone A PDU 17
038-004-335 93"
Zone A PDU 7
Zone B PDU 7
038-004-334 93"
Zone B PDU 17
038-004-334 93"
Chassis 3
038-004-335 93"
Zone A PDU 6
038-004-335 93"
Zone A PDU 5
Zone B PDU 5
038-004-334 93"
Zone B PDU 6
038-004-334 93"
Chassis 2
038-004-335 93"
Zone A PDU 16
038-004-335 93"
Zone A PDU 15
Zone B PDU 15
038-004-334 93"
Zone B PDU 16
038-004-334 93"
Chassis 1
038-004-335 93"
Zone A PDU 4
038-004-335 93"
Zone A PDU 3
Zone B PDU 3
038-004-334 93"
Zone B PDU 4
038-004-334 93"
EMPTY 1U
3 2 1
Zone B
Line Cords
3 2 1
Zone A
Line Cords

Figure 138. EX3000D single-phase AC power cabling

Three-phase AC power cabling

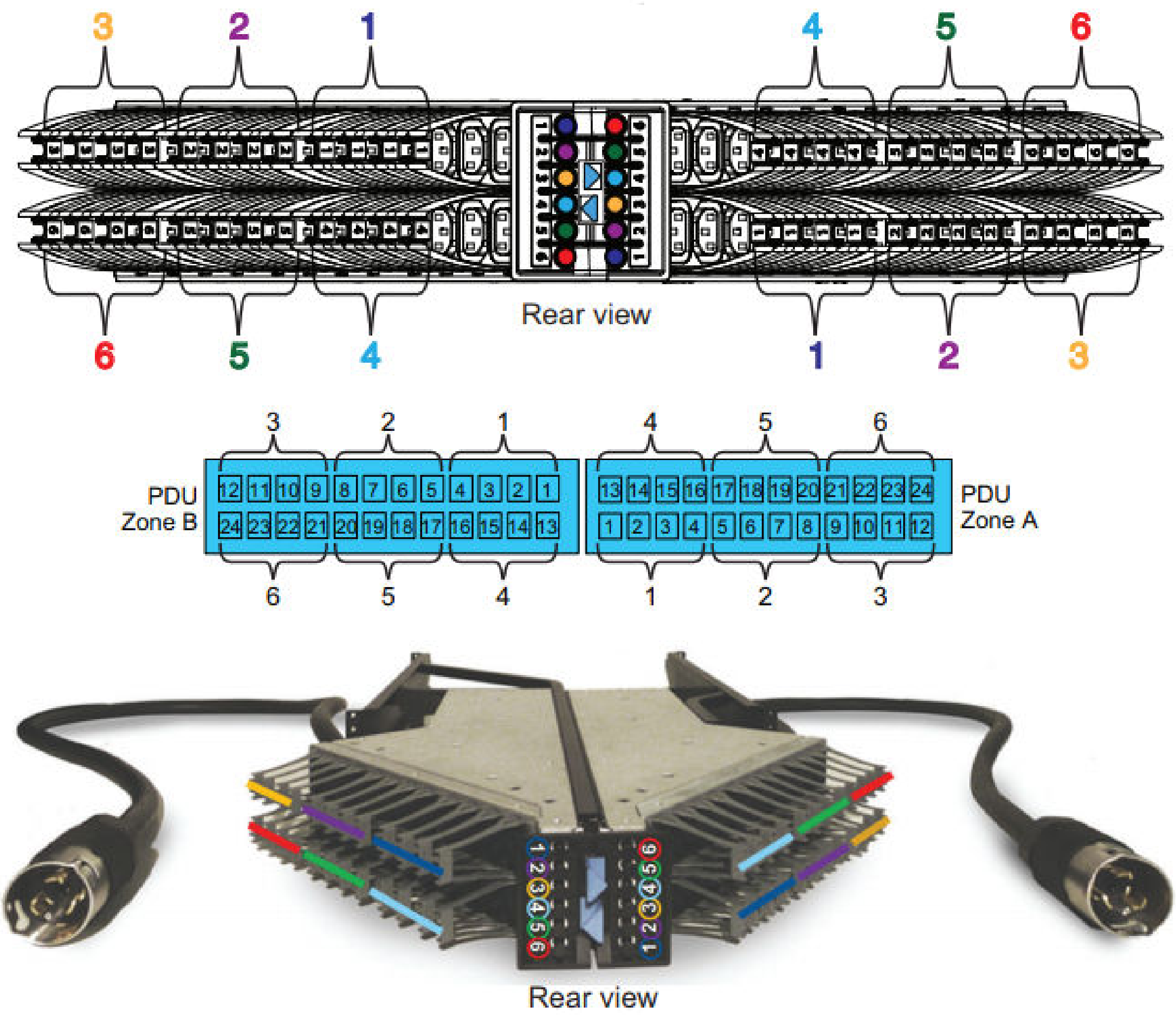

3
2
1
4
5
6
6
5
4
Rear view
1
2
3
3
2
1
4
5
6
PDU
Zone B
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
PDU
Zone A
6
5
4
1
2
3
Rear view

Figure 139. PDU three-phase diagram

The legends in the following diagrams map colored cables to part numbers and cable lengths.

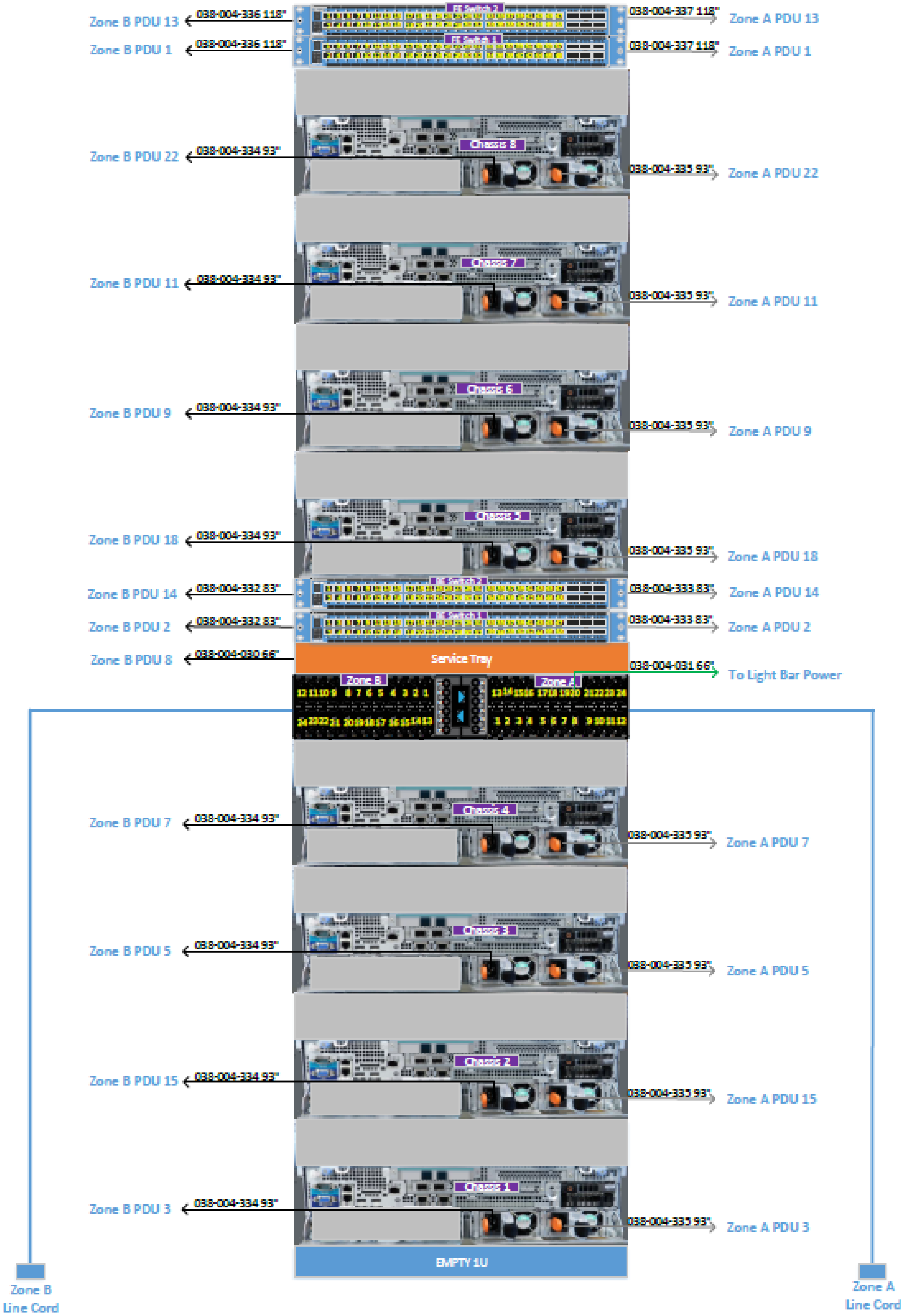

Zone B PDU 13
038-004-336 118"
FE Switch 2
038-004-337 118"
Zone A PDU 13
Zone B PDU 1
038-004-336 118"
FE Switch 1
038-004-337 118"
Zone A PDU 1
Chassis 8
Zone B PDU 22
038-004-334 93"
038-004-335 93"
Zone A PDU 22
Chassis 7
Zone B PDU 11
038-004-334 93"
038-004-335 93"
Zone A PDU 11
Chassis 6
Zone B PDU 9
038-004-334 93"
038-004-335 93"
Zone A PDU 9
Chassis 5
Zone B PDU 18
038-004-334 93"
038-004-335 93"
Zone A PDU 18
Zone B PDU 14
038-004-332 83"
BE Switch 2
038-004-333 83"
Zone A PDU 14
Zone B PDU 2
038-004-332 83"
BE Switch 1
038-004-333 83"
Zone A PDU 2
Zone B PDU 8
038-004-030 66"
Service Tray
038-004-031 66"
To Light Bar Power
Zone B
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
Zone A
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12
Chassis 4
Zone B PDU 7
038-004-334 93"
038-004-335 93"
Zone A PDU 7
Chassis 3
Zone B PDU 5
038-004-334 93"
038-004-335 93"
Zone A PDU 5
Chassis 2
Zone B PDU 15
038-004-334 93"
038-004-335 93"
Zone A PDU 15
Chassis 1
Zone B PDU 3
038-004-334 93"
038-004-335 93"
Zone A PDU 3
EMPTY 1U
Zone B
Line Cord
Zone A
Line Cord

Figure 140. EX3000S three-phase delta AC power cabling

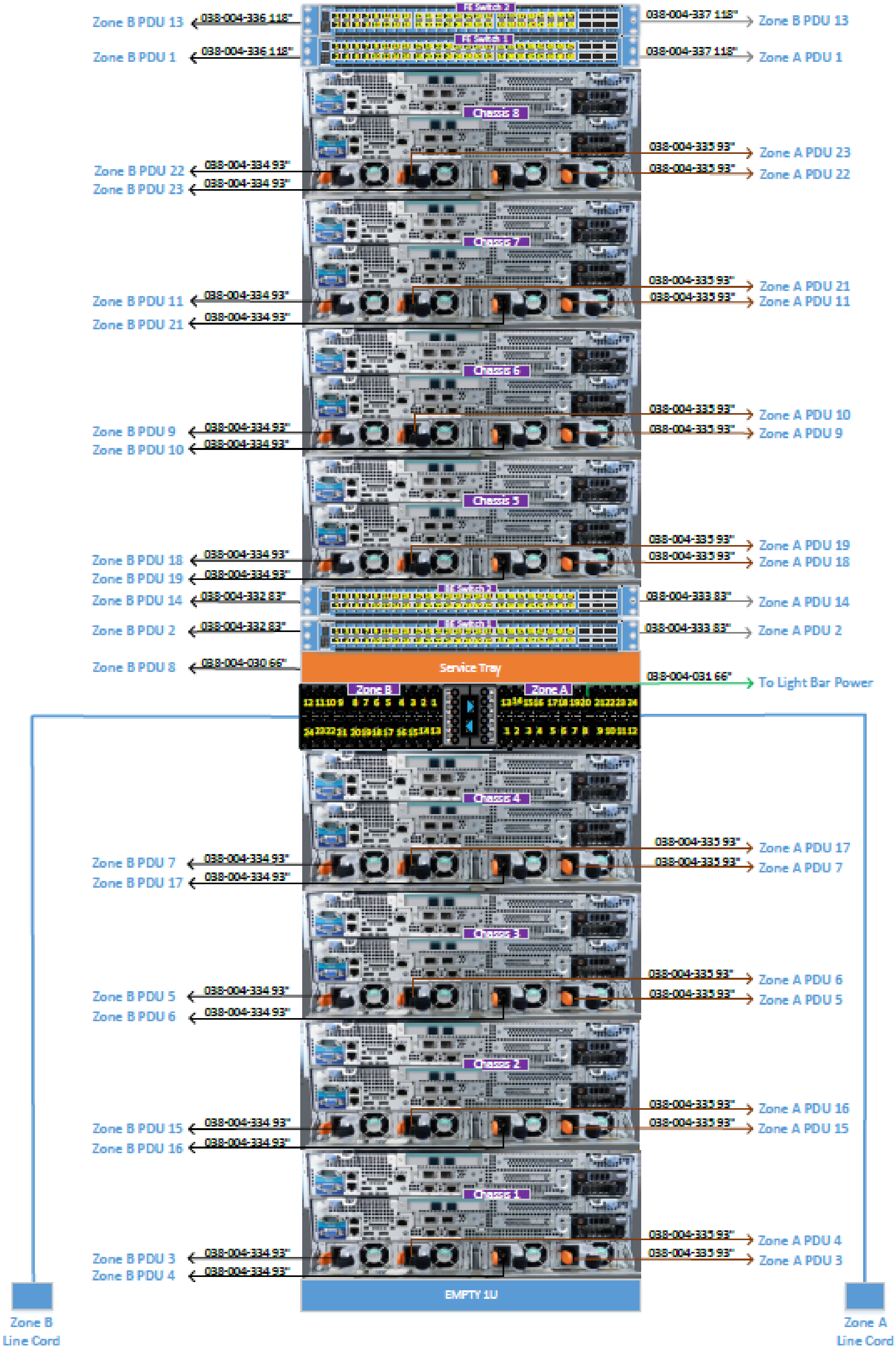

FE Switch 2
Zone B PDU 13
038-004-336 118"
038-004-337 118"
Zone B PDU 13
FE Switch 1
Zone B PDU 1
038-004-336 118"
038-004-337 118"
Zone A PDU 1
Chassis 8
038-004-335 93"
Zone A PDU 23
Zone B PDU 22
038-004-334 93"
038-004-335 93"
Zone A PDU 22
Zone B PDU 23
038-004-334 93"
Chassis 7
038-004-335 93"
Zone A PDU 21
Zone B PDU 11
038-004-334 93"
038-004-335 93"
Zone A PDU 11
Zone B PDU 21
038-004-334 93"
Chassis 6
038-004-335 93"
Zone A PDU 10
Zone B PDU 9
038-004-334 93"
038-004-335 93"
Zone A PDU 9
Zone B PDU 10
038-004-334 93"
Chassis 5
038-004-335 93"
Zone A PDU 19
Zone B PDU 18
038-004-334 93"
038-004-335 93"
Zone A PDU 18
Zone B PDU 19
038-004-334 93"
Zone B PDU 14
038-004-332 83"
038-004-333 83"
Zone A PDU 14
Zone B PDU 2
038-004-332 83"
038-004-333 83"
Zone A PDU 2
Zone B PDU 8
038-004-030 66"
Service Tray
038-004-031 66"
To Light Bar Power
Zone B
Zone A
12 11 10 9 8 7 6 5 4 3 2 1
13 14 15 16 17 18 19 20 21 22 23 24
24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
Chassis 4
038-004-335 93"
Zone A PDU 17
Zone B PDU 7
038-004-334 93"
038-004-335 93"
Zone A PDU 7
Zone B PDU 17
038-004-334 93"
Chassis 3
038-004-335 93"
Zone A PDU 6
Zone B PDU 5
038-004-334 93"
038-004-335 93"
Zone A PDU 5
Zone B PDU 6
038-004-334 93"
Chassis 2
038-004-335 93"
Zone A PDU 16
Zone B PDU 15
038-004-334 93"
038-004-335 93"
Zone A PDU 15
Zone B PDU 16
038-004-334 93"
Chassis 1
038-004-335 93"
Zone A PDU 4
Zone B PDU 3
038-004-334 93"
038-004-335 93"
Zone A PDU 3
Zone B PDU 4
038-004-334 93"
EMPTY 1U
Zone B
Line Cord
Zone A
Line Cord

Figure 141. EX3000D three-phase delta AC power cabling

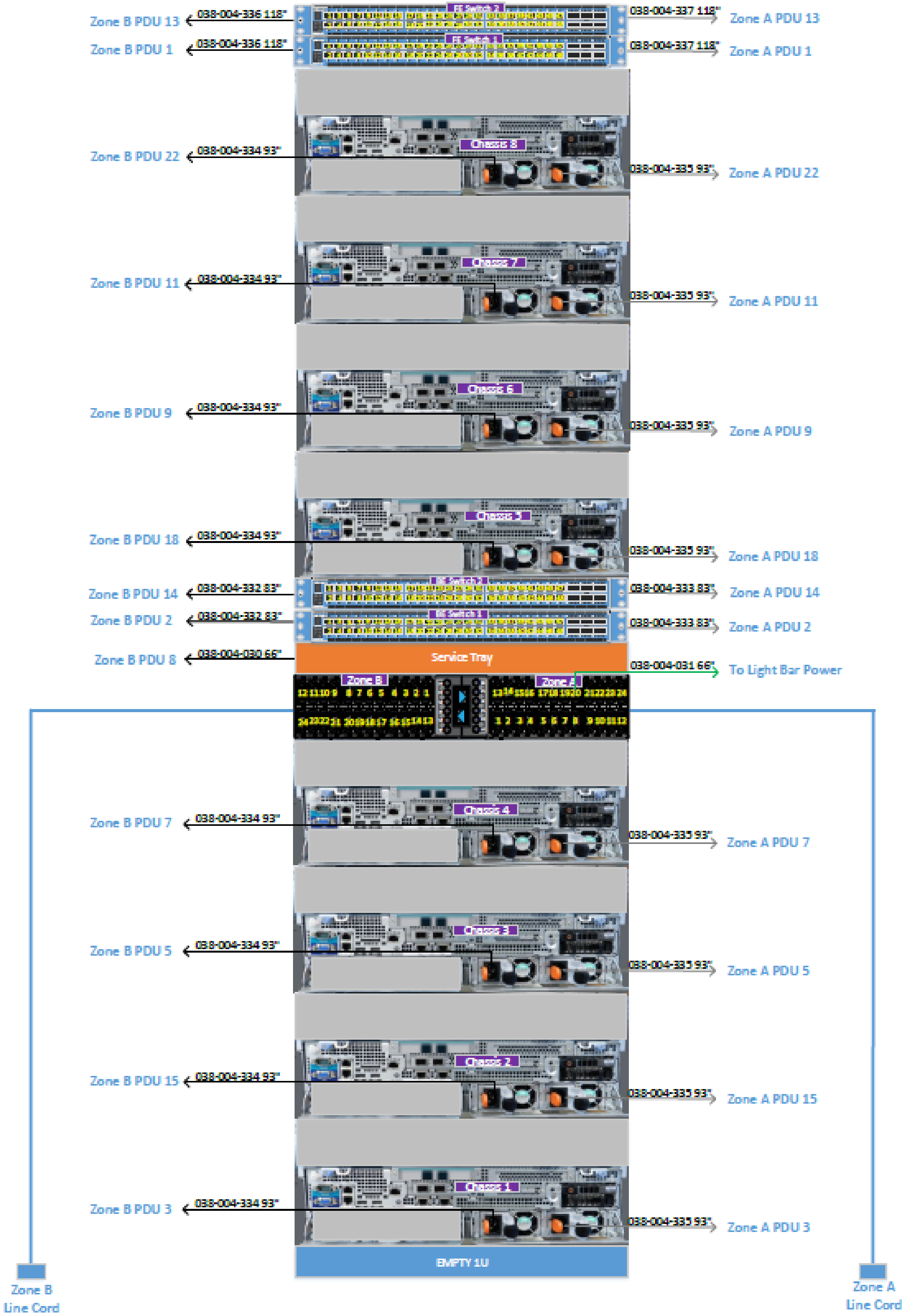

Zone B PDU 13
038-004-336 118"
FE Switch 2
038-004-337 118"
Zone A PDU 13
Zone B PDU 1
038-004-336 118"
FE Switch 1
038-004-337 118"
Zone A PDU 1
Zone B PDU 22
038-004-334 93"
Chassis 8
038-004-335 93"
Zone A PDU 22
Zone B PDU 11
038-004-334 93"
Chassis 7
038-004-335 93"
Zone A PDU 11
Zone B PDU 9
038-004-334 93"
Chassis 6
038-004-335 93"
Zone A PDU 9
Zone B PDU 18
038-004-334 93"
Chassis 5
038-004-335 93"
Zone A PDU 18
Zone B PDU 14
038-004-332 83"
BE Switch 2
038-004-333 83"
Zone A PDU 14
Zone B PDU 2
038-004-332 83"
BE Switch 1
038-004-333 83"
Zone A PDU 2
Zone B PDU 8
038-004-030 66"
Service Tray
038-004-031 66"
To Light Bar Power
Zone B
Zone A
12 11 10 9 8 7 6 5 4 3 2 1
13 14 15 16 17 18 19 20 21 22 23 24
24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
Zone B PDU 7
038-004-334 93"
Chassis 4
038-004-335 93"
Zone A PDU 7
Zone B PDU 5
038-004-334 93"
Chassis 3
038-004-335 93"
Zone A PDU 5
Zone B PDU 15
038-004-334 93"
Chassis 2
038-004-335 93"
Zone A PDU 15
Zone B PDU 3
038-004-334 93"
Chassis 1
038-004-335 93"
Zone A PDU 3
EMPTY 1U
Zone B
Line Cord
Zone A
Line Cord

Figure 142. EX3000S three-phase WYE AC power cabling

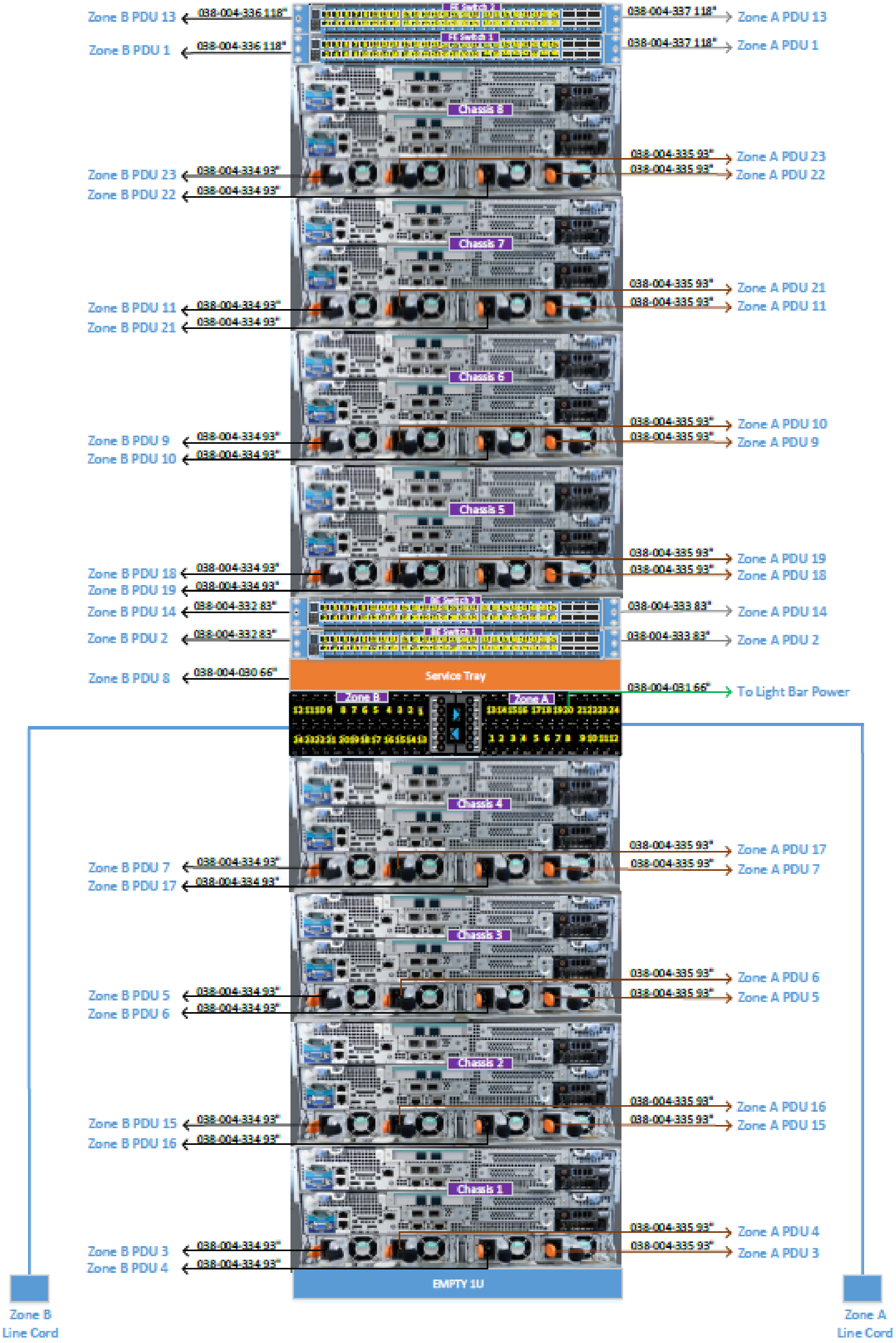

Zone B PDU 13
038-004-336 118"
FE Switch 2
038-004-337 118"
Zone A PDU 13
Zone B PDU 1
038-004-336 118"
FE Switch 1
038-004-337 118"
Zone A PDU 1
Chassis 8
038-004-335 93"
Zone A PDU 23
038-004-335 93"
Zone A PDU 22
Zone B PDU 23
038-004-334 93"
Zone B PDU 22
038-004-334 93"
Chassis 7
038-004-335 93"
Zone A PDU 21
038-004-335 93"
Zone A PDU 11
Zone B PDU 11
038-004-334 93"
Zone B PDU 21
038-004-334 93"
Chassis 6
038-004-335 93"
Zone A PDU 10
038-004-335 93"
Zone A PDU 9
Zone B PDU 9
038-004-334 93"
Zone B PDU 10
038-004-334 93"
Chassis 5
038-004-335 93"
Zone A PDU 19
038-004-335 93"
Zone A PDU 18
Zone B PDU 18
038-004-334 93"
Zone B PDU 19
038-004-334 93"
Zone B PDU 14
038-004-332 83"
038-004-333 83"
Zone A PDU 14
Zone B PDU 2
038-004-332 83"
038-004-333 83"
Zone A PDU 2
Zone B PDU 8
038-004-030 66"
Service Tray
038-004-031 66"
To Light Bar Power
Zone B
Zone A
Chassis 4
038-004-335 93"
Zone A PDU 17
038-004-335 93"
Zone A PDU 7
Zone B PDU 7
038-004-334 93"
Zone B PDU 17
038-004-334 93"
Chassis 3
038-004-335 93"
Zone A PDU 6
038-004-335 93"
Zone A PDU 5
Zone B PDU 5
038-004-334 93"
Zone B PDU 6
038-004-334 93"
Chassis 2
038-004-335 93"
Zone A PDU 16
038-004-335 93"
Zone A PDU 15
Zone B PDU 15
038-004-334 93"
Zone B PDU 16
038-004-334 93"
Chassis 1
038-004-335 93"
Zone A PDU 4
038-004-335 93"
Zone A PDU 3
Zone B PDU 3
038-004-334 93"
Zone B PDU 4
038-004-334 93"
EMPTY 1U
Zone B Line Cord
Zone A Line Cord

Figure 143. EX3000D three-phase WYE AC power cabling

EX3000 iDRAC cabling

This section provides wiring diagrams for the iDRAC cables that connect the iDRAC port on the node to the Fox back-end switch for the EX3000S system (single node chassis configuration) and the EX3000D system (dual node chassis configuration).

The EX3000S node iDRAC port to the Fox switch (BE1) port connections are listed in the following table.

Table 64. EX3000S node iDRAC port to BE1 port mapping

Node 1 iDRAC port	BE1 Port 17
Node 2 iDRAC port	BE1 Port 18
Node 3 iDRAC port	BE1 Port 19
Node 4 iDRAC port	BE1 Port 20
Node 5 iDRAC port	BE1 Port 21
Node 6 iDRAC port	BE1 Port 22
Node 7 iDRAC port	BE1 Port 23
Node 8 iDRAC port	BE1 Port 24

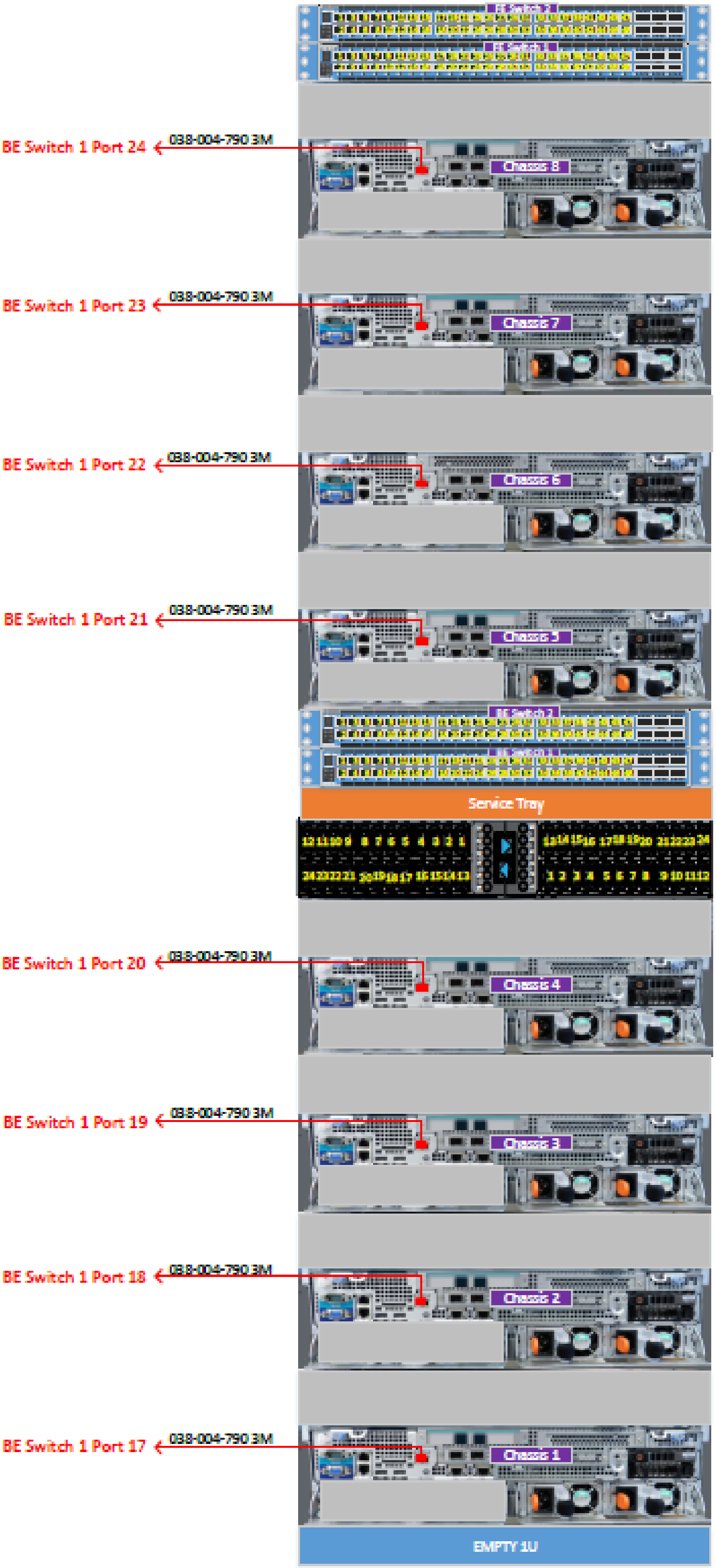

BE Switch 1 Port 24
038-004-790 3M
Chassis 8
BE Switch 1 Port 23
038-004-790 3M
Chassis 7
BE Switch 1 Port 22
038-004-790 3M
Chassis 6
BE Switch 1 Port 21
038-004-790 3M
Chassis 5
BE Switch 2
Service Tray
BE Switch 1 Port 20
038-004-790 3M
Chassis 4
BE Switch 1 Port 19
038-004-790 3M
Chassis 3
BE Switch 1 Port 18
038-004-790 3M
Chassis 2
BE Switch 1 Port 17
038-004-790 3M
Chassis 1
EMPTY 1U

Figure 144. EX3000S iDRAC cabling

The EX3000D node iDRAC port to the Fox switch (BE1) port connections are listed in the following table.

Table 65. EX3000D node iDRAC port to BE1 port mapping

Node 1 iDRAC port (chassis 1)	BE1 Port 17
Node 2 iDRAC port (chassis 1)	BE1 Port 18
Node 3 iDRAC port (chassis 2)	BE1 Port 19
Node 4 iDRAC port (chassis 2)	BE1 Port 20
Node 5 iDRAC port (chassis 3)	BE1 Port 21
Node 6 iDRAC port (chassis 3)	BE1 Port 22
Node 7 iDRAC port (chassis 4)	BE1 Port 23
Node 8 iDRAC port (chassis 4)	BE1 Port 24
Node 9 iDRAC port (chassis 5)	BE1 Port 25
Node 10 iDRAC port (chassis 5)	BE1 Port 26
Node 11 iDRAC port (chassis 6)	BE1 Port 27
Node 12 iDRAC port (chassis 6)	BE1 Port 28
Node 13 iDRAC port (chassis 7)	BE1 Port 29
Node 14 iDRAC port (chassis 7)	BE1 Port 30
Node 15 iDRAC port (chassis 8)	BE1 Port 31
Node 16 iDRAC port (chassis 8)	BE1 Port 32

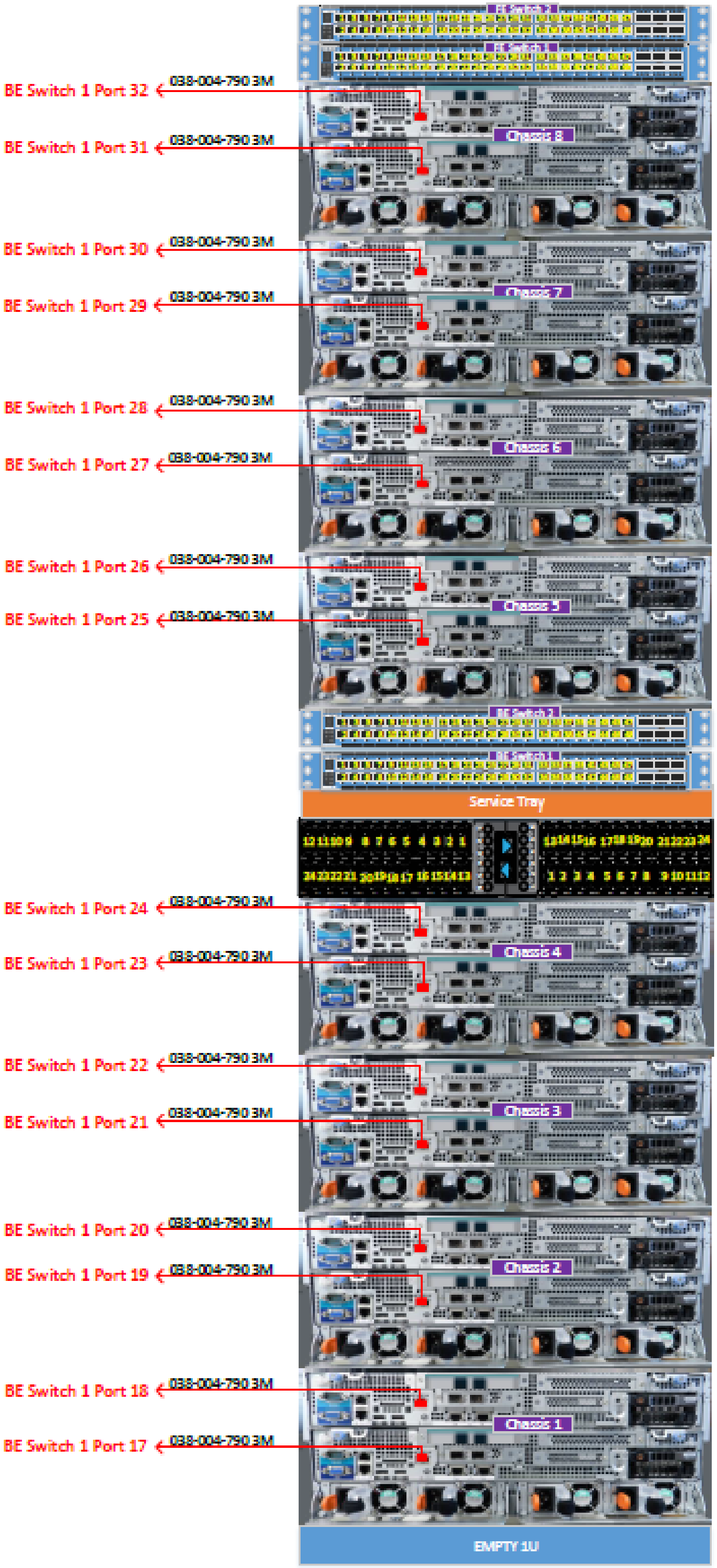

BE Switch 1 Port 32
038-004-790 3M
BE Switch 1 Port 31
038-004-790 3M
Chassis 8
BE Switch 1 Port 30
038-004-790 3M
BE Switch 1 Port 29
038-004-790 3M
Chassis 7
BE Switch 1 Port 28
038-004-790 3M
BE Switch 1 Port 27
038-004-790 3M
Chassis 6
BE Switch 1 Port 26
038-004-790 3M
BE Switch 1 Port 25
038-004-790 3M
Chassis 5
BE Switch 2
BE Switch 1
Service Tray
BE Switch 1 Port 24
038-004-790 3M
BE Switch 1 Port 23
038-004-790 3M
Chassis 4
BE Switch 1 Port 22
038-004-790 3M
BE Switch 1 Port 21
038-004-790 3M
Chassis 3
BE Switch 1 Port 20
038-004-790 3M
BE Switch 1 Port 19
038-004-790 3M
Chassis 2
BE Switch 1 Port 18
038-004-790 3M
BE Switch 1 Port 17
038-004-790 3M
Chassis 1
EMPTY 1U

Figure 145. EX3000D iDRAC cabling

EX3000 network cabling

The network cabling diagrams apply to the EX3000 appliance in a customer-provided rack.

Customers connect to an EX3000 appliance by way of 25 GbE ports on the front-end switches. For an EX3000 appliance, the 25 GbE ports run at 25 GbE. Customer configurations can include 25 GbE front-end switches provided by Dell Technologies or customers may provide their own front-end switches.

To distinguish between the two front-end switches and the two back-end switches, each switch has a nickname for S5148F:

- Hare: The top S5148F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to EX3000 nodes.
- Rabbit: The bottom S5148F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to EX3000 nodes.
- Hound: The top S5148F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the nodes.
- Fox: The bottom S5148F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the nodes.

To distinguish between the two front-end switches and the two back-end switches, each switch has a nickname for S5248F:

- Hare: The top S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX3000 nodes.
- Rabbit: The bottom S5248F 1U 25 GbE front-end switch running 25 GbE SFP28 ports to the EX3000 nodes.
- Hound: The top S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX3000 nodes.
- Fox: The bottom S5248F 1U 25 GbE back-end switch running 25 GbE SFP28 ports to the EX3000 nodes.

The front-end switch and back-end switch connections to an EX3000S node are shown in the following diagram.

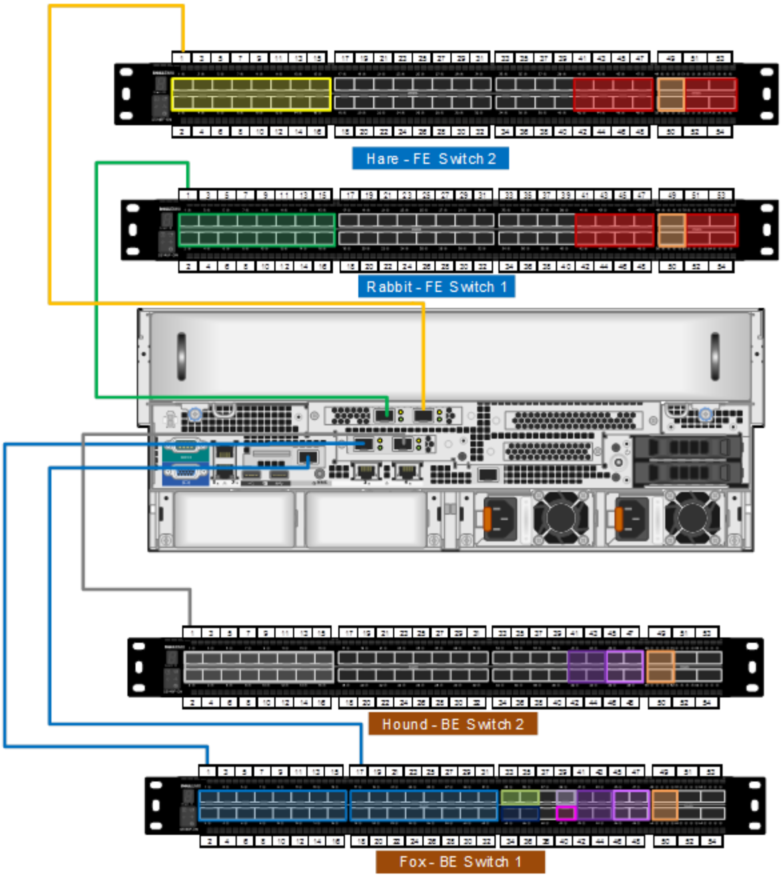


Figure 146. Front-end and back-end switch connections to an EX3000S node

The front-end switch and back-end switch connections to an EX3000D node are shown in the following diagram.

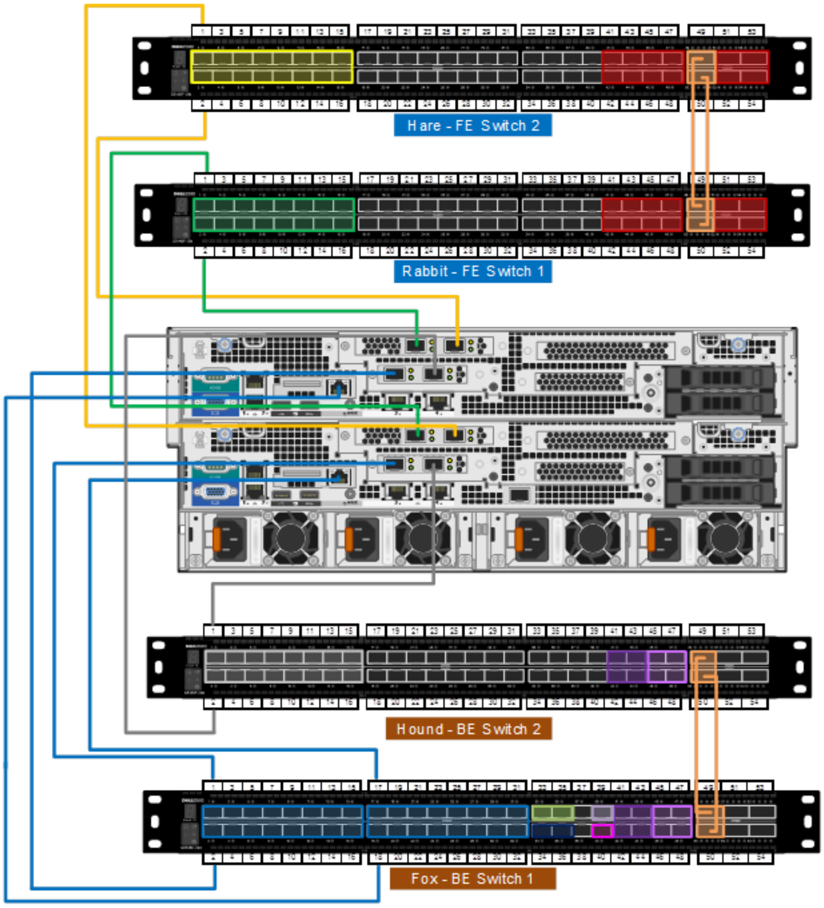
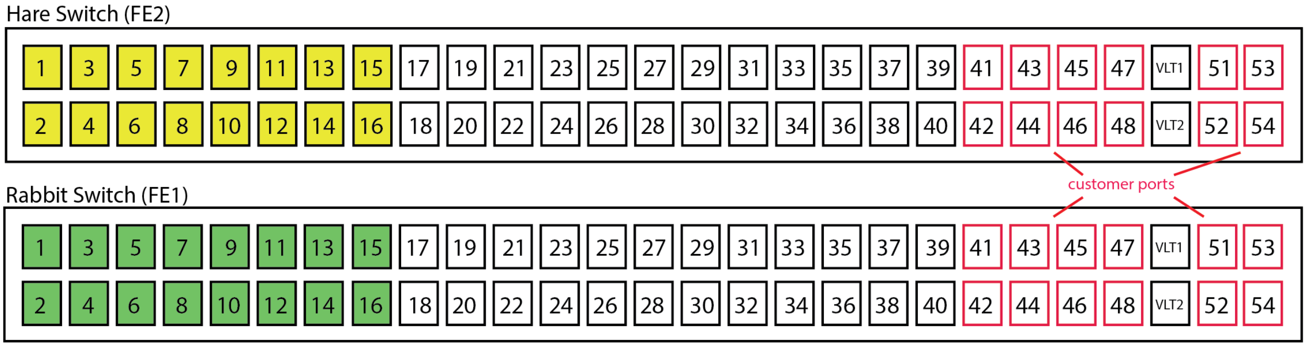


Figure 147. Front-end and back-end switch connections to an EX3000D node

The numbered front-end switch ports used for connecting to the ports on the EX3000 nodes are shown in the following diagram. Port 1 on the Hare switch (FE2) connects to port 4 on Node 1. Port 2 on the Hare switch (FE2) connects to port 4 on Node 2, and so on. Similarly, Port 1 on the Rabbit switch (FE1) connects to port 3 on Node 1. Port 2 on the Rabbit switch (FE1) connects to port 3 on Node 2, and so on.



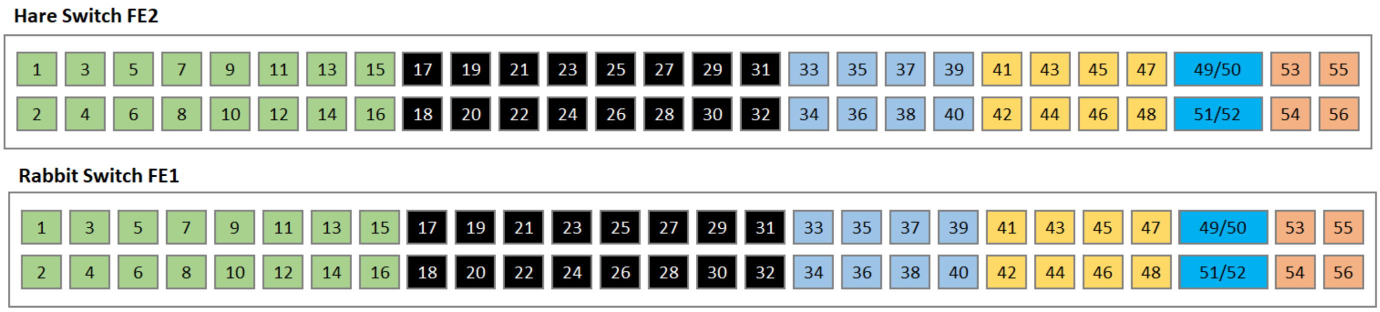
Hare Switch (FE2)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Rabbit Switch (FE1)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Figure 148. Node ports on front-end S5148F switches


Hare Switch FE2

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Rabbit Switch FE1

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49/50	53	55
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	51/52	54	56

Figure 149. Node ports on front-end S5248F switches

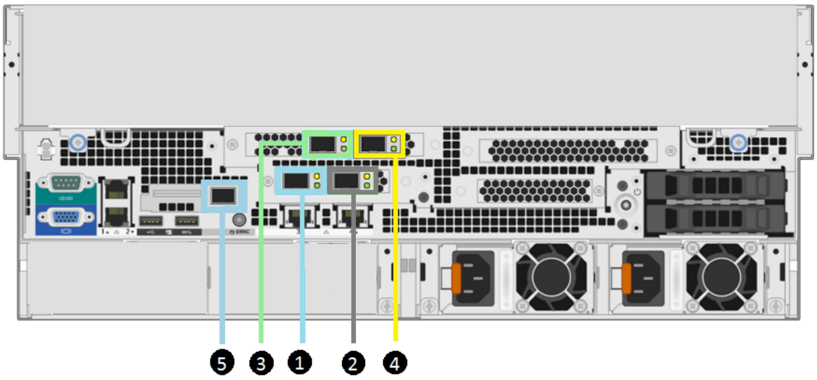
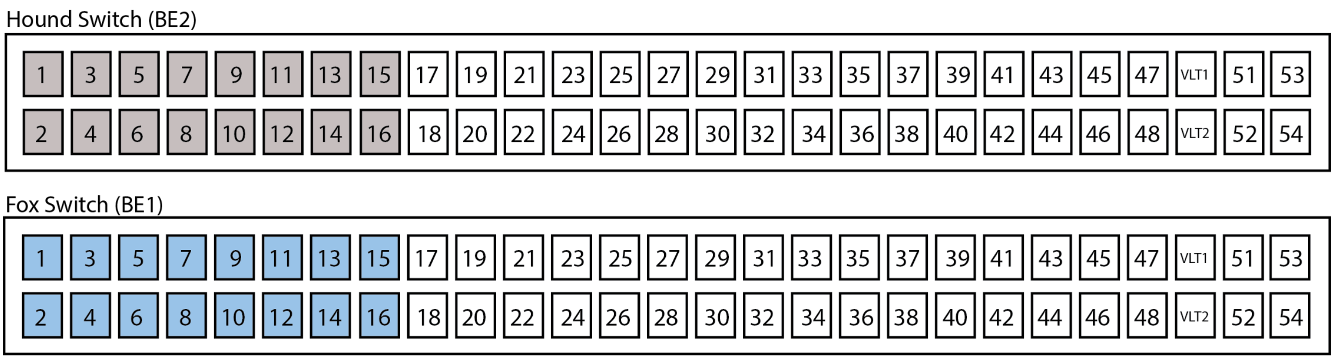


Figure 150. Back-end switch, front-end switch, and iDRAC ports on an EX3000S node

Table 66. Legend for Back-end switch, front-end switch, and iDRAC ports on EX3000S node

Legend	Description
1	BE1 Fox switch port
2	BE2 Hound switch port
3	FE1 Rabbit switch port
4	FE2 Hare switch port
5	iDRAC Port

The numbered back-end switch ports used for connecting to the ports on the EX3000 nodes are shown in the following diagram. Port 1 on the Hound switch (BE2) connects to port 2 on Node 1. Port 2 on the Hound switch (BE2) connects to port 2 on Node 2, and so on. Similarly, Port 1 on the Fox switch (BE1) connects to port 1 on Node 1. Port 2 on the Fox switch (BE1) connects to port 1 on Node 2, and so on.


Hound Switch (BE2)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Fox Switch (BE1)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	VLT1	51	53
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	VLT2	52	54

Figure 151. Node ports on back-end S5148F switches

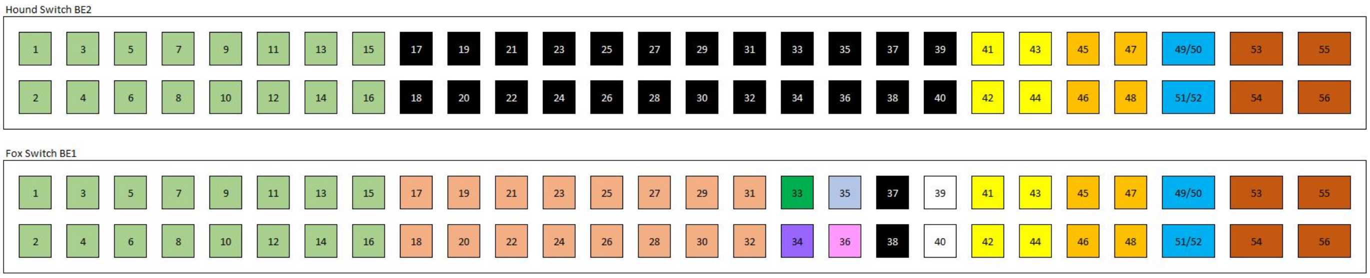
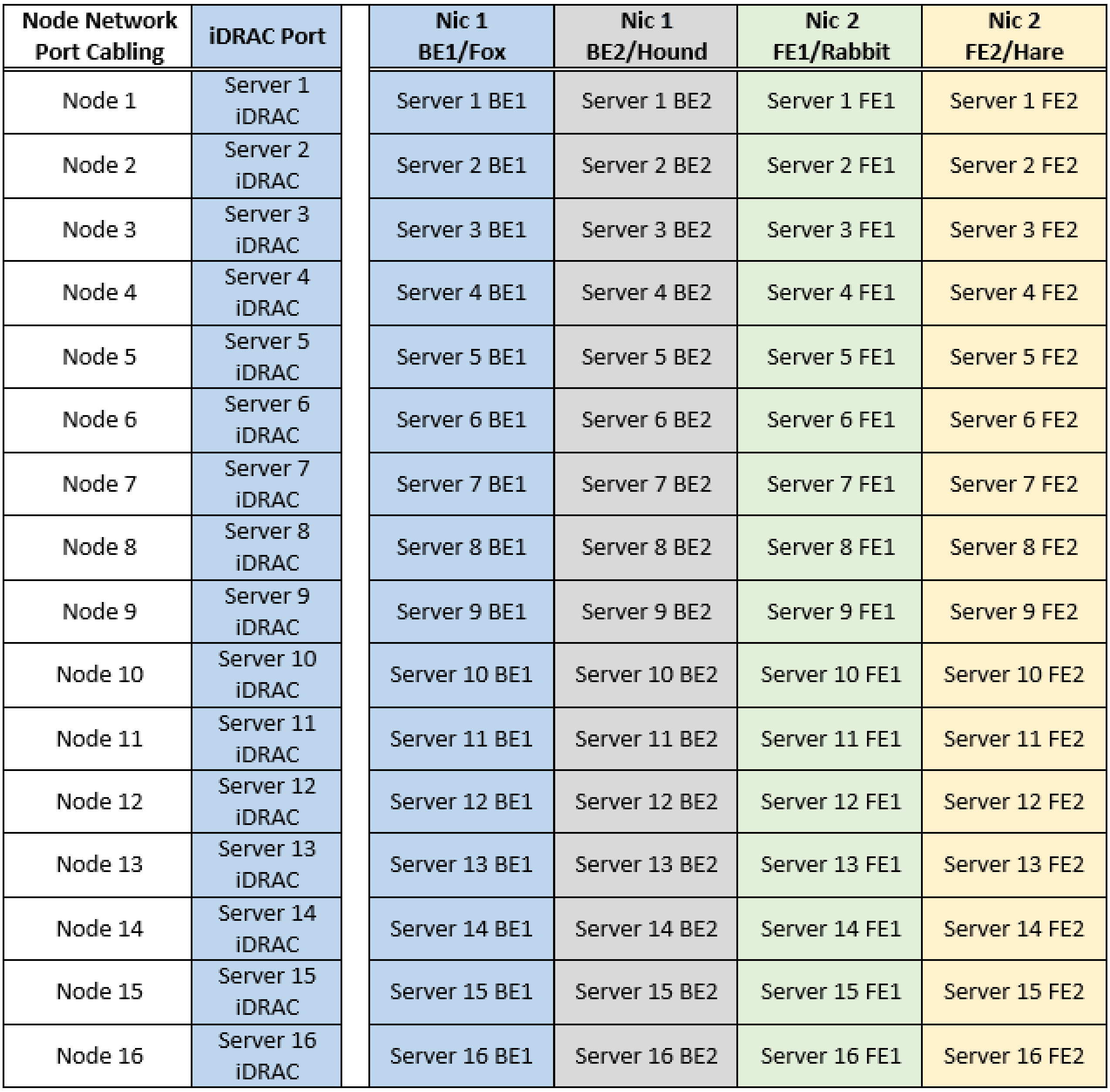

Hound Switch BE2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56
Fox Switch BE1
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49/50 53 55
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 51/52 54 56

Figure 152. Node ports on back-end S5248F switches

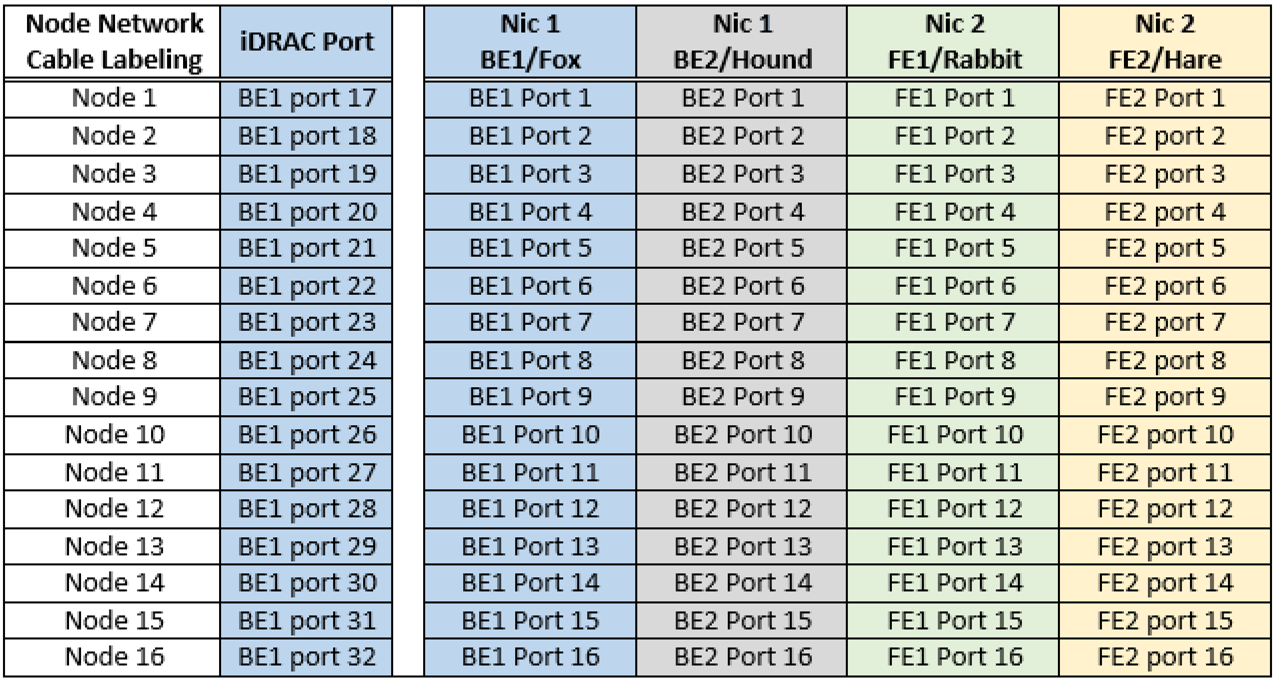
The EX3000 node port to the iDRAC, back-end switch, and front-end switch port connections are listed in the following table.



Node Network Port Cabling	iDRAC Port	Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	Server 1 iDRAC	Server 1 BE1	Server 1 BE2	Server 1 FE1	Server 1 FE2
Node 2	Server 2 iDRAC	Server 2 BE1	Server 2 BE2	Server 2 FE1	Server 2 FE2
Node 3	Server 3 iDRAC	Server 3 BE1	Server 3 BE2	Server 3 FE1	Server 3 FE2
Node 4	Server 4 iDRAC	Server 4 BE1	Server 4 BE2	Server 4 FE1	Server 4 FE2
Node 5	Server 5 iDRAC	Server 5 BE1	Server 5 BE2	Server 5 FE1	Server 5 FE2
Node 6	Server 6 iDRAC	Server 6 BE1	Server 6 BE2	Server 6 FE1	Server 6 FE2
Node 7	Server 7 iDRAC	Server 7 BE1	Server 7 BE2	Server 7 FE1	Server 7 FE2
Node 8	Server 8 iDRAC	Server 8 BE1	Server 8 BE2	Server 8 FE1	Server 8 FE2
Node 9	Server 9 iDRAC	Server 9 BE1	Server 9 BE2	Server 9 FE1	Server 9 FE2
Node 10	Server 10 iDRAC	Server 10 BE1	Server 10 BE2	Server 10 FE1	Server 10 FE2
Node 11	Server 11 iDRAC	Server 11 BE1	Server 11 BE2	Server 11 FE1	Server 11 FE2
Node 12	Server 12 iDRAC	Server 12 BE1	Server 12 BE2	Server 12 FE1	Server 12 FE2
Node 13	Server 13 iDRAC	Server 13 BE1	Server 13 BE2	Server 13 FE1	Server 13 FE2
Node 14	Server 14 iDRAC	Server 14 BE1	Server 14 BE2	Server 14 FE1	Server 14 FE2
Node 15	Server 15 iDRAC	Server 15 BE1	Server 15 BE2	Server 15 FE1	Server 15 FE2
Node 16	Server 16 iDRAC	Server 16 BE1	Server 16 BE2	Server 16 FE1	Server 16 FE2

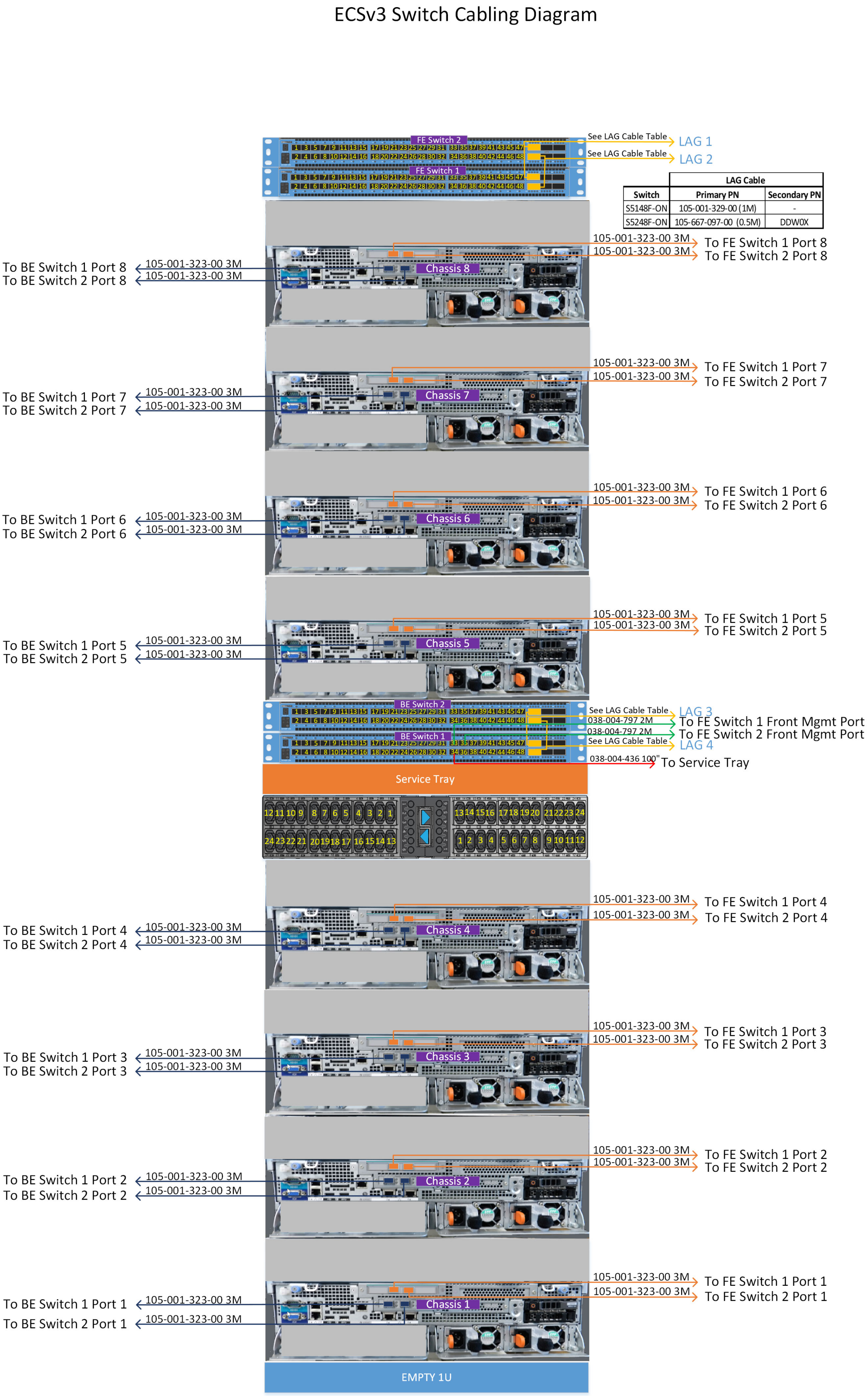
Figure 153. EX3000 node network port cabling connections

The EX3000 node network cable labeling is listed in the following table.



Node Network Cable Labeling	iDRAC Port		Nic 1 BE1/Fox	Nic 1 BE2/Hound	Nic 2 FE1/Rabbit	Nic 2 FE2/Hare
Node 1	BE1 port 17		BE1 Port 1	BE2 Port 1	FE1 Port 1	FE2 Port 1
Node 2	BE1 port 18		BE1 Port 2	BE2 Port 2	FE1 Port 2	FE2 port 2
Node 3	BE1 port 19		BE1 Port 3	BE2 Port 3	FE1 Port 3	FE2 port 3
Node 4	BE1 port 20		BE1 Port 4	BE2 Port 4	FE1 Port 4	FE2 port 4
Node 5	BE1 port 21		BE1 Port 5	BE2 Port 5	FE1 Port 5	FE2 port 5
Node 6	BE1 port 22		BE1 Port 6	BE2 Port 6	FE1 Port 6	FE2 port 6
Node 7	BE1 port 23		BE1 Port 7	BE2 Port 7	FE1 Port 7	FE2 port 7
Node 8	BE1 port 24		BE1 Port 8	BE2 Port 8	FE1 Port 8	FE2 port 8
Node 9	BE1 port 25		BE1 Port 9	BE2 Port 9	FE1 Port 9	FE2 port 9
Node 10	BE1 port 26		BE1 Port 10	BE2 Port 10	FE1 Port 10	FE2 port 10
Node 11	BE1 port 27		BE1 Port 11	BE2 Port 11	FE1 Port 11	FE2 port 11
Node 12	BE1 port 28		BE1 Port 12	BE2 Port 12	FE1 Port 12	FE2 port 12
Node 13	BE1 port 29		BE1 Port 13	BE2 Port 13	FE1 Port 13	FE2 port 13
Node 14	BE1 port 30		BE1 Port 14	BE2 Port 14	FE1 Port 14	FE2 port 14
Node 15	BE1 port 31		BE1 Port 15	BE2 Port 15	FE1 Port 15	FE2 port 15
Node 16	BE1 port 32		BE1 Port 16	BE2 Port 16	FE1 Port 16	FE2 port 16

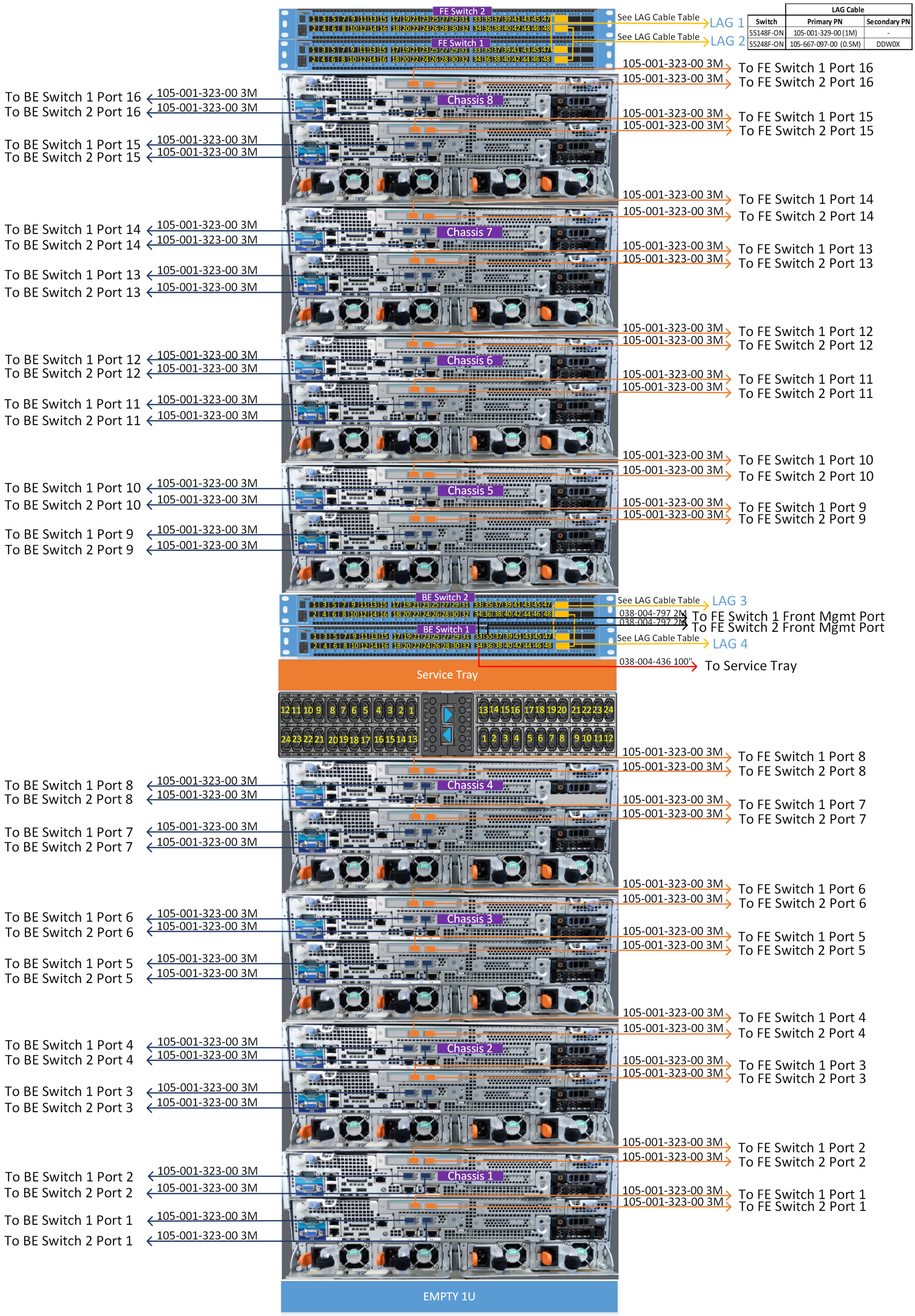
Figure 154. EX3000 node network cable labeling


ECSv3 Switch Cabling Diagram
FE Switch 2
FE Switch 1
See LAG Cable Table
LAG 1
See LAG Cable Table
LAG 2
105-001-323-00 3M
To FE Switch 1 Port 8
105-001-323-00 3M
To FE Switch 2 Port 8
To BE Switch 1 Port 8
105-001-323-00 3M
To BE Switch 2 Port 8
105-001-323-00 3M
Chassis 8
105-001-323-00 3M
To FE Switch 1 Port 7
105-001-323-00 3M
To FE Switch 2 Port 7
To BE Switch 1 Port 7
105-001-323-00 3M
To BE Switch 2 Port 7
105-001-323-00 3M
Chassis 7
105-001-323-00 3M
To FE Switch 1 Port 6
105-001-323-00 3M
To FE Switch 2 Port 6
To BE Switch 1 Port 6
105-001-323-00 3M
To BE Switch 2 Port 6
105-001-323-00 3M
Chassis 6
105-001-323-00 3M
To FE Switch 1 Port 5
105-001-323-00 3M
To FE Switch 2 Port 5
To BE Switch 1 Port 5
105-001-323-00 3M
To BE Switch 2 Port 5
105-001-323-00 3M
Chassis 5
BE Switch 2
BE Switch 1
See LAG Cable Table
LAG 3
038-004-797 2M
To FE Switch 1 Front Mgmt Port
038-004-797 2M
To FE Switch 2 Front Mgmt Port
See LAG Cable Table
LAG 4
038-004-436 100"
To Service Tray
Service Tray
12 11 10 9 8 7 6 5 4 3 2 1
13 14 15 16 17 18 19 20 21 22 23 24
24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
105-001-323-00 3M
To FE Switch 1 Port 4
105-001-323-00 3M
To FE Switch 2 Port 4
To BE Switch 1 Port 4
105-001-323-00 3M
To BE Switch 2 Port 4
105-001-323-00 3M
Chassis 4
105-001-323-00 3M
To FE Switch 1 Port 3
105-001-323-00 3M
To FE Switch 2 Port 3
To BE Switch 1 Port 3
105-001-323-00 3M
To BE Switch 2 Port 3
105-001-323-00 3M
Chassis 3
105-001-323-00 3M
To FE Switch 1 Port 2
105-001-323-00 3M
To FE Switch 2 Port 2
To BE Switch 1 Port 2
105-001-323-00 3M
To BE Switch 2 Port 2
105-001-323-00 3M
Chassis 2
105-001-323-00 3M
To FE Switch 1 Port 1
105-001-323-00 3M
To FE Switch 2 Port 1
To BE Switch 1 Port 1
105-001-323-00 3M
To BE Switch 2 Port 1
105-001-323-00 3M
Chassis 1
EMPTY 1U

	LAG Cable	
Switch	Primary PN	Secondary PN
S5148F-ON	105-001-329-00 (1M)	-
S5248F-ON	105-667-097-00 (0.5M)	DDW0X

Figure 155. EX3000S network cabling

ECSv3 Switch Cabling Diagram



	LAG Cable	
Switch	**Primary PN**	**Secondary PN**
S5148F-ON	105-001-329-00 (1M)	-
S5248F-ON	105-667-097-00 (0.5M)	DDW0X

FE Switch 2
FE Switch 1
See LAG Cable Table
LAG 1
See LAG Cable Table
LAG 2
105-001-323-00 3M
To FE Switch 1 Port 16
105-001-323-00 3M
To FE Switch 2 Port 16
To BE Switch 1 Port 16
To BE Switch 2 Port 16
Chassis 8
To FE Switch 1 Port 15
To FE Switch 2 Port 15
To BE Switch 1 Port 15
To BE Switch 2 Port 15
To FE Switch 1 Port 14
To FE Switch 2 Port 14
To BE Switch 1 Port 14
To BE Switch 2 Port 14
Chassis 7
To FE Switch 1 Port 13
To FE Switch 2 Port 13
To BE Switch 1 Port 13
To BE Switch 2 Port 13
To FE Switch 1 Port 12
To FE Switch 2 Port 12
To BE Switch 1 Port 12
To BE Switch 2 Port 12
Chassis 6
To FE Switch 1 Port 11
To FE Switch 2 Port 11
To BE Switch 1 Port 11
To BE Switch 2 Port 11
To FE Switch 1 Port 10
To FE Switch 2 Port 10
To BE Switch 1 Port 10
To BE Switch 2 Port 10
Chassis 5
To FE Switch 1 Port 9
To FE Switch 2 Port 9
To BE Switch 1 Port 9
To BE Switch 2 Port 9
BE Switch 2
BE Switch 1
See LAG Cable Table
LAG 3
038-004-797 2M
To FE Switch 1 Front Mgmt Port
038-004-797 2M
To FE Switch 2 Front Mgmt Port
See LAG Cable Table
LAG 4
038-004-436 100"
To Service Tray
Service Tray
To FE Switch 1 Port 8
To FE Switch 2 Port 8
To BE Switch 1 Port 8
To BE Switch 2 Port 8
Chassis 4
To FE Switch 1 Port 7
To FE Switch 2 Port 7
To BE Switch 1 Port 7
To BE Switch 2 Port 7
To FE Switch 1 Port 6
To FE Switch 2 Port 6
To BE Switch 1 Port 6
To BE Switch 2 Port 6
Chassis 3
To FE Switch 1 Port 5
To FE Switch 2 Port 5
To BE Switch 1 Port 5
To BE Switch 2 Port 5
To FE Switch 1 Port 4
To FE Switch 2 Port 4
To BE Switch 1 Port 4
To BE Switch 2 Port 4
Chassis 2
To FE Switch 1 Port 3
To FE Switch 2 Port 3
To BE Switch 1 Port 3
To BE Switch 2 Port 3
To FE Switch 1 Port 2
To FE Switch 2 Port 2
To BE Switch 1 Port 2
To BE Switch 2 Port 2
Chassis 1
To FE Switch 1 Port 1
To FE Switch 2 Port 1
To BE Switch 1 Port 1
To BE Switch 2 Port 1
EMPTY 1U

Figure 156. EX3000D network cabling

For information about connecting multiple ECS appliances, seeNetwork connections between multiple ECS appliances in a single site .

8

Third-party rack requirements

Topics:

- Third-party rack requirements

Third-party rack requirements

Customers who want to assemble an ECS appliance using their own racks must ensure that the racks meet the requirements that are described in the following guides:

- *ECS EX900 Third-Party Rack Planning and Installation Guide*
- *ECS EX500 Third-Party Rack Planning and Installation Guide*
- *ECS EX5000 Third-Party Rack Planning and Installation Guide*
- *ECS EX300 Third-Party Rack Installation Guide*
- *ECS EX3000 Third-Party Rack Installation Guide*

A

Topics:

- Document feedback

Document feedback

If you have any feedback or suggestions regarding this document, mailto:ecs.docfeedback@dell.com.

Index

A

Aggregation switch pair S5232F 24

B

Back-end switch pair 16, 22

E

EX300 disk drives 139
EX300 network cabling 150
EX300 power cabling 139
EX300 Upgrade Paths 135
EX3000 disk drives 168
EX3000 network cabling 183
EX3000 power cabling 169
EX3000 upgrade paths 160
EX500 disk drives 115
EX500 network cabling 124
EX500 power cabling 115
EX500 upgrade paths 110
EX5000 Cable Kits 62
EX5000 disk drives 37
EX5000 network cabling 53
EX5000 power cabling 38
EX5000 upgrade paths 36
EXF900 Cable Kits 98
EXF900 disk drives 72
EXF900 network cabling 94
EXF900 power cabling 72
EXF900 Upgrade Paths 71

F

Front-end and back-end switch connections 17, 23
Front-end switch pair 15

S

Server back view 114
Server front view 69, 111, 136, 161
Server rear view 70, 138, 165